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EXPLORING EXPEDITION.

DURING THE YEARS  
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UNDER THE COMMAND OF  
CHARLES WILKES, U. S. N.  
VOL. XVII.

BOTANY.  
CRYPTOGAMIA.

MUSCI—By WILLIAM S. SULLIVANT.  
LICHENES—By EDWARD TUCKERMAN.

ALGÆ—By J. W. BAILEY AND W. H. HARVEY.  
FUNGI—By M. A. CURTIS AND M. J. BERKELEY.

PHANEROGAMIA

OF PACIFIC NORTH AMERICA,

By JOHN TORREY.

EDITED BY ASA GRAY.

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# CRYPTOGAMIA

OF THE

UNITED STATES EXPLORING EXPEDITION.



MUSCI.

BY

WILLIAM S. SULLIVANT.





# CRYPTOGAMIA.

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## ORD. MUSCI.

### SUBORD. I. SPHAGNACEÆ.

#### 1. SPHAGNUM, *Linn.*

##### 1. SPHAGNUM CYMBIFOLIUM, *Ehr.*

*Sphagnum cymbifolium*, Ehrh. Han. Magaz. 1780, p. 235; Schimp. Hist. Nat. Sphaig. p. 73, t. 19.

HAB. Orange Harbor, Fuegia. Sandwich Islands. New Zealand.

##### 2. SPHAGNUM CUSPIDATUM, *Ehr.*

*Sphagnum cuspidatum*, Ehr. Decad. Crypt. n. 251; Schimp. Hist. Nat. Sphaig. p. 66, t. 16.

Var. RECURVUM: *foliis brevioribus oblongo-lanceolatis siccis recurvis.*

HAB. Orange Harbor. Var. Organ Mountains, Brazil.

##### 3. SPHAGNUM FIMBRIATUM, *Wils.*

*Sphagnum fimbriatum*, Wils. in Crypt. Antaret. p. 92; Schimp. Hist. Nat. Sphaig. p. 64, t. 15.

## SUBORD. II. ANDRÆACEÆ.

1. ANDRÆA, *Ehr.*1. ANDRÆA ALPINA, *Linn.*

*Andræa alpina*, Linn. Sp. Pl. ed. 2, p. 1601; Bryol. Europ. 6, Andr. Monogr., p. 18, t. 6.

HAB. Andes of Peru. Orange Harbor, Fuegia.

2. ANDRÆA ACUTIFOLIA, *Hook. fil. & Wils.*

*Andræa acutifolia*, Hook. fil. & Wils. in Crypt. Antaret. p. 6, t. 151, f. 2.

HAB. Andes of Peru.

3. ANDRÆA PETROPHILA, *Ehrh.*

*Andræa petrophila*, Ehrh. Beitr. 1, p. 192; Bryol. Europ. 6, Andr. Monogr. p. 13, t. 1.

HAB. Andes of Peru.

## SUBORD. III. BRYACEÆ.

## Div. 1. ACROCARPI.

## Tribe 1. POTTIÆ.

1. POTTIA, *Ehr.*1. POTTIA HEIMII, *Hedw.*

*Pottia Heimii*, Hedw. Stirp. Crypt. 1, p. 88, t. 30; Bryol. Europ. 2, Pott. Monogr. p. 12, t. 7.

HAB. Snow line behind St. Jago, Chili. Specimens larger than the European.

## Tribe 2. ANÆCTANGIÆÆ.

1. ANÆCTANGIUM, *Schwægr.*1. ANÆCTANGIUM PERUVIANUM, *Sp. Nov.* (Tab. 1.)

*A. dioicum*; *parce radiculosum*; *ramis paucis elongatis subclavatis*; *foliis rigidis e basi ovali lineali-lanceolatis obtusiusculis valido-costatis*; *capsula ovali late annulata, pedicello sicco quadrangulari*; *antheridiis copiose paraphysatis.*

HAB. High Andes of Peru.

Grows in compact but easily separable tufts of a dusky yellow. Stems erect, with few radicles, one and a half inches high, sparingly divided: branches few, elongated, slightly clavate. Leaves rigid, crowded, from an erect oblong-ovate clasping base, linear-lanceolate, spreading, canaliculate, of a firm thick texture composed of minute subquadrate cellules: costa heavy, extending to the rather obtuse point. Capsule oval, wide-mouthed after the fall of the acicular-rostrate operculum: annulus broad, compound, persistent: pedicel tender; when dry, quadrangular in section. Dioicous: the male plant intermixed with the fertile: male buds in fascicles on short branches: paraphyses numerous, linear, as long as the antheridia.

Approaches *A. compactum*, but is a more robust plant with stems less branched and far less radiculose. It has leaves of a different shape and texture, a broad annulus, a quadrangular pedicel, and numerous paraphyses in the male bud.

PLATE 1, A.—ANÆCTANGIUM PERUVIANUM: one male and three fertile plants, of the natural size. Fig. 1. A plant. 2, 3, 4, 5, 6. Stem leaves. 7. Portion of base of leaf showing the reticulation. 8. Upper portion of leaf showing the same. 9, 10. Cross sections of leaf. 11. Perichætium, pedicel, and capsule. 12, 13. Perichætial leaves. 14. Cross section of point of a perichætial leaf. 15, 16. Capsules. 17. Operculum. 18. Portion of mouth of capsule. 19. Top of male plant. 20. Male bud. 21, 22, 23, 24. Perigonal leaves. 25. Antheridium with a paraphysis.—The details magnified.



## Tribe 3. DICRANEÆ.

1. DICRANUM, *Hedw.*1. DICRANUM DENSUM, *Hook.*

*Dicranum densum*, Hook. Musc. Exot. t. 140.

HAB. Andes of Peru. Specimens without fruit.

2. DICRANUM TENUIFOLIUM, *Hook. fil. & Wils.*

*Dicranum tenuifolium*, Hook. fil. & Wils. Lond. Jour. Bot. 1844, p. 542; Flo. Antarc. t. 152, f. 7.

HAB. Orange Harbor, Fuegia.

3. DICRANUM ACIPHYLLUM, *Hook. fil. & Wils.*

*Dicranum aciphyllum*, Hook. fil. & Wils. Lond. Jour. Bot. 1844, p. 541; Flo. Antaret. t. 152, f. 3.

HAB. Cape Horn, Orange Harbor, Fuegia.

4. DICRANUM CONGESTUM, *Brid.*

*Dicranum congestum*, Brid. Sp. Musc. 1, p. 176; Bryol. Europ. 1, Dicran. Monogr. p. 36, t. 29.

HAB. Spipen River, Oregon.

5. DICRANUM IMPONENS, *Mont.*

*Dicranum imponens*, Mont. Voy. Astrol. and Zel. Crypt. p. 298.

*Dicranum involutifolium*, Sulliv. in Hook. Jour. Bot. 2, p. 316.

HAB. Orange Harbor, Fuegia.

6. DICRANUM SCOPARIUM, *Hedw.*

*Dicranum scoparium*, Hedw. Sp. Musc. p. 126; Bryol. Europ. 1, Dicran. Monog. p. 34, t. 26 and 27.

HAB. Oregon.

7. DICRANUM SANDWICENSE, *Sp. Nov.* (Tab. 1.)

*D. procerum flagelliferum*; foliis late lineari-lanceolatis obtusiusculis apice serratis, costa tenui percursis, areolatione sinuoso-lineari, perichætialibus permagnis; capsula cylindracea suberecta lævi aciculari-operculata.

Var.  $\beta$ . CONDENSATUM: caulibus abbreviatis robustis, foliis confertis.

Var.  $\gamma$ . ELONGATUM: caulibus elongatis, foliis dissitis patentissimis.

HAB. Sandwich Islands, Kaala Mountains, Oahu; var.  $\beta$ , Mauna Kea, Hawaii; var.  $\gamma$ , banks of the crater, East Maui.

One of the largest species of the genus. Stems stout, 5–6 inches high (in var.  $\beta$ , 1–2 inches; in var.  $\gamma$ , 10–12 inches), sparingly divided, producing from their apices slender upright flagellæ as in *D. flagellare*. Leaves spreading on all sides from a semi-amplexicaul oblong base, broad linear-lanceolate, somewhat obtuse, more or less canaliculate, strongly serrate above, with a slender percurrent costa which is dentate on its back near the apex; areolation of sinuous-linear cellules: perichætial leaves very large and conspicuous, convolute, their points short and serrate, costa variable. Capsule cylindrical, nearly erect or erecto-cernuous, smooth when dry and empty: operculum with a long erect subulate rostrum. Male buds found only among the tomentose radicles of the fertile stems.

A very distinct species. May possibly be Montagne's *D. streptophyllum*, so named from the leaves being "*spiraliter pluries tortis*," a character which our specimens do not exhibit.

PLATE 1, B.—DICRANUM SANDWICENSE: two plants of the natural size. Fig. 1, 2. Stem leaves. 3. Upper portion of same. 4. Costa of same, with teeth. 5, 6, 7, 8, 9. Cross sections of leaf. 10. Portion of base of leaf, showing the reticulation. 11. Cellules of the same. 12. Upper portion of leaf, showing the reticulation. 13. Cellules of the same. 14. Perichætium. 15. Upper perichætial leaf. 16. Lower perichætial leaf. 17, 18, 19. Capsules without operculum. 20, 21. Capsules with operculum. 22. Two teeth of the peristome. 23. Calyptra. 24. Male bud. 25. Antheridium and paraphysis.—The details enlarged.

8. DICRANUM MAJUS, *Schwægr.*

*Dicranum majus*, Schwægr. Suppl. 1, 1, p. 163, t. 40; Bryol. Europ. 1, Dicran. Monogr. p. 43, t. 37.

HAB. Port Discovery, Oregon.

9. DICRANUM ROBUSTUM, *Hook. fil. & Wils.*

*Dicranum robustum*, Hook. fil. & Wils. in Flo. Antaret. p. 406, t. 152, f. 8.

HAB. Orange Harbor, Fuegia; also New Zealand.

10. DICRANUM MENZIESII, *Tayl.*

*Dicranum Menziesii*, Tayl. in Phytol. 2, p. 1094; Hook. fil. & Wils. in Flo. Antaret. p. 128, t. 58, f. 4.

HAB. Bay of Islands, New Zealand.

2. CAMPYLOPUS, *Brid.*

1. CAMPYLOPUS FLEXUOSUS, *Br. & Sch.*

*Campylopus flexuosus*, Bryol. Europ. 1, Camp. Monogr. p. 3, t. 1.

Var. *foliis apice caulis valde congestis, cellulis alaribus densioribus burneis in disculum extus protuberantem collectis; capsulis numerosioribus, operculo longiore: (forsan species propria.)*

HAB. Sandwich Islands, base of Mauna Kea, Hawaii: the var. Mountains behind Honolulu, Oahu.

2. CAMPYLOPUS EXASPERATUS, *Nees*.

*Trichostomum exasperatum*, Nees. in Act. Acad. Nat. Leop. 11, 2, p. 134, t. 15.

*Campylopus exasperatus*, Brid. Bryol. Univ. 1, p. 473.

HAB. Mountains of Hawaii and Kauai, Sandwich Islands.

3. CAMPYLOPUS DOZYANUS, *C. Müll.*

*Dicranum Dozyanum*, C. Müll. Synop. Musc. Frond. 1, p. 385.

HAB. Tahiti and Eimeo, Society Islands.

4. CAMPYLOPUS XANTHOPHYLLUS, *Mont.*

*Campylopus xanthophyllus*, Mont. in Ann. Sc. Nat. 1845; Fl. Chil. 7, p. 176, t. 4, f. 2.

HAB. Bay of Islands, New Zealand.

5. CAMPYLOPUS CLAVATUS, *R. Br.*

*Dicranum clavatum*, R. Br. in Schwægr. Suppl. 3, 2, t. 255.

HAB. Sydney, New South Wales.

6. CAMPYLOPUS LAMELLATUS, *Mont.*

*Campylopus lamellatus*, Mont. in Ann. Sc. Nat. 1838, p. 52; Flo. Boliv. p. 90.

HAB. Organ Mountains, Brazil. Kaala Mountains, Sandwich Islands. Specimens barren.



3. CERATODON, *Brid.*1. CERATODON PURPUREUS, *Hedw.*

*Ceratodon purpureus*, Brid. Bryol. Univ. 1, p. 480; Bryol. Europ. 2, Cerat. Monogr. p. 5, t. 1 and 2.

*Dicranum purpureum*, Hedw. Sp. Musc. p. 136, t. 36.

HAB. Sandwich Islands. Feejee Islands.

4. DICNEMON, *Schwægr.*1. DICNEMON CALYCINUS, *Hook.*

*Leucodon calycinus*, Hook. Musc. Exot. t. 17.

*Dicnemon calycinus*, Schwægr. Suppl. 2, 1, p. 126.

HAB. New Zealand.

2. DICNEMON RUGOSUS, *Hook.*

*Leucodon rugosus*, Hook. Musc. Exot. t. 20.

*Dicnemon rugosus*, Schwægr. Suppl. 2, 2, p. 72, t. 74.

HAB. Tahiti, Society Islands.

3. DICNEMON PALLIDUS, *Hook.*

*Leucodon pallidus*, Hook. Musc. Exot. t. 72.

*Sclerodontium pallidum*, Schwægr. Suppl. 2, 1, p. 124, t. 134.

*Dicranum Sieberianum*, Hornsch. in Schwægr. Suppl. t. 252.

*Neckera pallida*, C. Müll. Synop. Musc. Frond. 2, p. 113.

HAB. Sydney, New South Wales. Specimens without fruit.

## Tribe 4. LEUCOBRYEÆ.

1. LEUCOBRYUM, *Hampe*.1. LEUCOBRYUM CANDIDUM, *Schwægr.*

*Dicranum Candidum*, Schwægr. Suppl. 2, 2, p. 119, t. 187.

HAB. Bay of Islands, New Zealand.

2. OCTOBLEPHARUM, *Hedw.*1. OCTOBLEPHARUM ALBIDUM, *Hedw.*

*Octoblepharum albidum*, Hedw. Musc. Frond. 3, p. 15, t. 6.

HAB. Mountains of Tahiti; also Sandwich Islands.

## Tribe 5. FISSIDENTEÆ.

1. FISSIDENS, *Hedw.*1. FISSIDENS GEMINIFLORUS, *Doz. & Molkb.?*

*Fissidens geminiflorus*, Doz. & Molkb. Bryol. Javan. p. 10, t. 9.?

HAB. Feejee Islands. Specimens very imperfect.

## Tribe 6. TRICHOSTOMEÆ.

1. TRICHOSTOMUM, *Hedw.*1. TRICHOSTOMUM ANDINUM, *Sp. Nov.* (Tab. 2.)

*T. dioicum*, subsimplex; foliis siccis appresso-crispatis, humectatis e basi oblonga amplexante subito patentissimis lineari-lanceolatis acuminatis

*canaliculatis usque ad apicem incurvam tereti-costatis; capsula ovali macrostoma late annulata, collo tumido.*

HAB. Andes of Peru, at an elevation of 15,000 feet. A few stems only found growing among tufts of a *Campylopus*.

Stems about 1 inch high, mostly simple. Leaves from an erect, oblong, amplexicaul base, suddenly wide-spreading, linear-acuminate, carinate-canaliculate, incurved at the apex; margins plain entire; costa terete heavy, extending to the point; areolation minute dense roundish in the upper portion of the leaf. Capsule erect oval, with a conspicuous collum, rather wide-mouthed; annulus large revolute; operculum erect long-rostrate: teeth of the peristome much as in *T. crispulum*, which the species resembles, but the differently shaped leaves, the distinct collum of the capsule, and presence of an annulus, sufficiently separate it.

PLATE 2, A.—TRICHOSTOMUM ANDINUM: one male and two fertile plants, of the natural size. Fig. 1. A plant. 2, 3, 4, 5, 6, 7. Stem leaves. 8, 9, 10. Cross sections of same. 11. Portion of base of leaf showing the reticulation. 12. Point of leaf showing the same. 13. Cellules of same. 14, 15. Capsules with opercula. 16. Peristome. 17. Teeth of peristome with portion of annulus. 18. Two antheridia, with a paraphysis.—All the analyses magnified.

## 2. STREPTOPOGON, Wils.

### 1. STREPTOPOGON ERYTHRODONTUS, Tayl.

*Barbula erythrodonta*, Tayl. in Lond. Jour. Bot. 1846, p. 50; Wils. l. c. p. 450, t. 15, f. F.

*Streptopogon erythrodontus*, Wils. in Hook. Jour. Bot. 1851, p. 57.

HAB. East Maui, north bank of the crater Haleakala, Sandwich Islands.

## 3. BARBULA, Hedw.

### 1. BARBULA CÆSPITOSA, Schwægr.

*Barbula cæspitosa*, Schwægr. Suppl. 1, 1, p. 120, t. 31.

HAB. Organ Mountains, near Rio Janeiro, Brazil.

2. BARBULA DEPRESSA, *Sp. Nov.* (Tab. 2.)

*B. laxe caespitosa ; foliis lanceolato-spathulatis costa excurrente subulato-cuspidatis superne minute guttulato-areolatis margine plus minus recurvis humectatis subtortis ; capsula cylindracea anguste annulata, peristomio depresso subturbinato.*

HAB. Near Valparaiso, Chili.

A rather stout species forming loose tufts of a brownish-green color. Stems 1½–2 inches high, usually with but one innovation from below the perichæcium ; radicles few. Leaves crisped when dry, and somewhat contorted when wet, lanceolate-subspathulate, repand at the obtuse apex, long cuspidate by the smooth excurrent costa ; margins more or less recurved ; areolation diaphanous, loose and oblong at the base, minute guttulate above : perichæcial leaves elongated, undulate on the margins. Capsule cylindrical, long, erect, with a narrow annulus ; peristome turbinate, the teeth with a narrow basilar membrane, long, much twisted, the spiral forming almost a right angle with the columella ; pedicels slender, flexuous. Calyptra, operculum, and male flowers not seen.

PLATE 2, *B.*—BARBULA DEPRESSA : two fertile plants of the natural size. Fig. 1. A plant. 2, 3, 4, 5, 6. Stem leaves. 7, 8, 9. Cross sections of leaf. 10. Portion of the base of a leaf, showing the reticulation. 11. Point of leaf, showing the same. 12, 13. Capsules. 14. Peristome. 15. Portion of peristome. 16. Portion of a tooth of peristome.—Analyses enlarged.

Tribe 7. DISTICHIEÆ.

1. DISTICHIMUM, *Br. & Sch.*

1. DISTICHIMUM CAPILLACEUM, *Br. & Sch.*

*Distichium capillaceum*, var. *brevifolium*, Bryol. Europ. 2, Distich. Monogr. p. 4, t. 1.

HAB. Casa Cancha, Andes of Peru.



## Tribe 8. ENCALYPTEÆ.

## 1. ENCALYPTA, Schreb.

## 1. ENCALYPTA CILIATA, Hedw.

*Encalypta ciliata*, Hedw. Sp. Musc. p. 61; Bryol. Europ. 3, Encalyp. Monogr. p. 10, t. 3.

HAB. Mauna Kea, Hawaii, Sandwich Islands.

## 2. ENCALYPTA SANDWICENSIS, Sp. Nov. (Tab. 3.)

*E. monoica*; foliis oblongo-lanceolatis et elongato-spathulatis convolutis papillois evanido-costatis; capsula gymnostoma cylindracea sicca 8-10 sulcata; calyptra tota superficie papillosa; flore masculo monophyllo.

HAB. Sides of Mauna Kea, Hawaii; banks of the crater Haleakala, East Maui; Sandwich Islands.

Densely cæspitose. Stems about 1 inch high, sparingly branched, radiculose. Leaves soft, oblong-lanceolate, and elongate-spathulate, convolute, margins crenulate by the protuberant cellules, which in the upper part of the leaf are hexagonal-rotund, rather large and papillulose; costa vanishing considerably below the apex. Capsule cylindrical, when dry contracted at the mouth and showing 8-10 straight longitudinal furrows, slightly apophysate. Peristome absent. Calyptra papillose on its whole exterior surface, more strongly so above. Male flower usually with only one perigonal leaf.

The absence of a peristome, the ribbed capsule, and the papillose calyptra, are the distinctive marks of this species.

PLATE 3, B.—ENCALYPTA SANDWICENSIS: plants, of the natural size. Fig. 1. A plant. 2, 3, 4. Leaves. 5, 6, 7. Cross sections of the same. 8. Cellules of leaf, seen in cross section. 9. Portion of the base of a leaf, showing the reticulation. 10. Point of leaf, showing the same. 11. Young fruit and male bud. 12. Vaginula, surmounted by the

ochrea, with archegonia and paraphyses at its base. 13. Calyptra inclosing the capsule. 14, 15, 16. Capsules. 17. Mouth of capsule. 18. Cross section of capsule. 19. Calyptra.—Details magnified.

## 2. CALYMPERES, Swartz.

### 1. CALYMPERES CONSTRICTA, *Sp. Nov.* (Tab. 3.)

*C. ramosa*; foliis spiraliter tristichis, e basi erecta amplexicauli patentibus lanceolatis convolutis late pellucido-limbatis sub apice valde constrictis, costa solida ad constrictionem perdurante ibique expansa corpusculisque confervoideis obsessa.

HAB. Sandwich Islands.

Stems branched, 1½–2 inches high. Leaves closely imbricating, arranged in three slack spiral rows, from a narrow erect sheathing base, spreading broad-lanceolate, subcylindrical-concave, suddenly constricted below the apex, the portion above the constriction being of a cup-like form and filled with numerous protruding fusiform attenuated 8–10 septate bodies, growing from the expanded apex of the heavy percurrent costa: the leaves finely and distantly denticulate, surrounded by a broad pellucid border, 5–10 minute linear cellules deep; cellules of the sheathing base hyaline, large, oblong, those of the lamina minute, rotund, opaque, green, and granular. Flowers and fruit not seen.

The shape of the leaf, the constriction below its apex, and the form of the bodies growing on the end of the costa, appear to distinguish this species from any heretofore described.

PLATE 3, A.—CALYMPERES CONSTRICTA: a plant of the natural size. Fig. 1. Portion of the stem with leaves. 2, 3, 4, 5. Leaves. 6, 7, 8. Points of leaves with confervoid filament. 9, 10. Confervoid filaments. 11, 12, 13. Cross sections of leaf. 14. Portion of lower part of leaf, showing the reticulation. 15. Point of leaf, showing the same. 16. Cellules of the leaf.—Details enlarged.

In the collection are a few barren stems of two other species of *Calymperes*; one collected on Carlshoff Island, Paumotu Group, is probably *C. Motleri*, Mitten in Bryol. Javan. p. 48, t. 38; the other from Tongatabu, and also from Carlshoff Island, accords well with *C. Molluccensis*, Schwægr. Suppl. t. 127.

### 3. SYRRHOPODON, *Schwægr.*

#### 1. SYRRHOPODON FASCICULATUS, *Hook. & Grev.*

*Syrrhopodon fasciculatus*, Hook. & Grev. in Edin. Jour. Sc. 3, p. 225; Schwægr. Suppl. 3, 2, t. 299.

HAB. Feejee Islands. Without fruit.

#### 2. SYRRHOPODON TAITENSIS, *Sp. Nov.* (Tab. 4.)

*S. procerum ramosum; ramis elongatis flexuosis; foliis e basi erecta amplexante incurvo-patentissimis linearibus longissimis canaliculatis subtortilibus incrassato-limbatis superne serratis apice abrupte breviangulatis costa valida apice expansa et excavata percursis.*

HAB. Tahiti, Society Islands.

A large species, growing in loose olive-green tufts. Stems divided near the base, ascending flexuous,  $2\frac{1}{2}$ –4 inches high; branches and leaves when dry subcircinnate. Leaves linear, narrow, 4–5 lines long, spreading, moderately incurved, from a short erect amplexicaul base, canaliculate, slightly twisted, serrate above, abruptly narrowed near the apex, surrounded by an opaque costa-like border, which in the sheathing part of the leaf is intramarginal; costa terete, percurrent, its apex discolored, expanded, and excavated, the seat probably of confervoid filaments, which, in our specimens, have fallen away. The sheathing part of the leaf is composed of large oblong pellucid cellules; the rest of the leaf is firm and opaque, consisting of minute, greenish, granular subquadrate cellules closely arranged in lines.

The species is no doubt dioicous. Since the engraving was made, we have found in the collection a stem abounding in male buds, situated in the axils of the leaves, small for the size of the plant, ellipsoidal and stipitate; leaves 7–10 ovate, lanceolate, costate; antheridia 5–7; paraphyses numerous, linear, 10–14 septate, longer than the antheridia.

PLATE 4, A.—SYRRHOPODON TAITENSIS: plants in a moist and in dry state, of the natural size. Fig. 1. Portions of stem and leaves. 2, 3, 4. Leaves. 5, 6. Points of leaves. 7, 8. Portions of leaves, showing the reticulation. 9, 10, 11. Cross sections of leaf. 12. Cross section of the sheathing base of the leaf.—Details enlarged.

### 3. SYRRHOPODON TRISTICHUS, Nees.

*Syrrhopodon tristichus*, Nees, in Schwaegr. Suppl. 4, 1, t. 311; Bryol. Javan. p. 55, t. 44.

HAB. Feejee Islands.

## Tribe 9. ZYGODONTÆ.

### 1. ZYGODON, Hook. & Tayl.

#### 1. ZYGODON PERUVIANUS, Sp. Nov. (Tab. 4.)

*Z. dioicous*; *elatus fastigiato-ramosus*; *foliis oblongo-lanceolatis acumina-  
tis squarrosis carinatis subcomplicatis, marginibus leniter recurvis sub-  
undulatis, costa subapice evanida*; *capsula ovali-obovata arcuata lon-  
gicolla sicca costata brevi-pedicellata, peristomio simplici 8-dentato,  
operculo longirostrato.*

HAB. Casa Cancha, Andes of Peru; at an elevation of 15,000 feet.

Grows in large, spongy rust-colored tufts. Stems 3–4 inches high, fastigiately branched, beset with short radicles to near their apex. Leaves decurrent at their base, arcuately recurved, oblong-lanceolate acuminate carinate, the lamina on each side of the costa complicate to half their width, thence to the margins gradually recurved, subundu-

late; costa usually vanishing below the point; areolation composed of minute subquadrate papillose cellules, those in the lower part of the leaf larger, oblong. Capsule oval-obovate, with a long collum tapering into the pedicel, horizontal-arcuate, subgibbous, striate, longitudinally ribbed when dry: peristome single, very fugacious; consisting of 8 thin hyaline triangular lanceolate distant teeth 5-7-articulated, with a median zigzag line, horizontal and reaching nearly halfway across the mouth. Operculum long-rostrate from a conic base: pedicel short (6-8 lines high) for the height of the plant, barely overtopping the innovations. Dioicous: the male plants intermixed with the fertile; the flowers terminal, gemmiform; perigonal leaves broad ovate, very concave, closely embracing the numerous antheridia and long filiform paraphyses.

There are on record several *Zygodontes* from the Andes of South America apparently closely allied to the present species, but no one of them combines the tall stems, the long taper-pointed squarrose leaves, the subpyriform arcuate capsule with a long attenuated collum, the short, rather stout pedicel, and the single 8-dentate peristome of *Z. Peruvianus*.

PLATE 4, B.—*ZYGODON PERUVIANUS*: one male and three fertile plants, of the natural size. Fig. 1, 2. Female and male plants. 3, 4, 5, 6, 7, 8. Leaves. 9, 10, 11. Cross sections of same. 12, 13. Portions of leaf, showing the reticulation. 14. Cellules. 15. Same, seen in cross section. 16, 17, 18. Capsules, with opercula. 19. Capsule, without operculum. 20. Peristome, with portion of capsule. 21. Teeth of the peristome. 22, 23. Perigonal leaves. 24. Antheridia, paraphyses, and perigonal leaf. 25. Vaginula, with archegonia and paraphyses.—Details magnified.

#### Tribe 10. ORTHOTRICHEÆ.

### 1. ORTHOTRICHUM, *Hedw.*

#### 1. ORTHOTRICHUM LEOCARPUM, *Br. & Sch.*

*Orthotrichum leio carpum*, Bryol. Europ. 3, Orthot. Monogr. p. 28, t. 15.

HAB. Sandwich Islands. Capsule not so obovate, nor the cilia of the peristome so erose-denticulate as in the North American form.

2. ORTHOTRICHUM LYELLII, *Hook.*

*Orthotrichum Lyellii*, Hook. ; Bryol. Europ. 3, Orthot. Monogr. p. 27, t. 16.

HAB. Near San Francisco, California. Our specimens belong to the var. *foliis longioribus siccitate magis crispatis* (Brid. Bryol. Univ. 1, p. 728), founded on specimens collected by Menzies at Nootka Sound.

3. ORTHOTRICHUM STURMII, *Hoppe & Hornsch.*

*Orthotrichum Sturmii*, Hpp. & Hsch. in Reg. Bot. Zeit. 1819, p. 89 ; Bryol. Europ. 3, Orthot. Monogr. p. 9, t. 2.

HAB. Mauna Kea, Hawaii, Sandwich Islands.

4. ORTHOTRICHUM PHYLLANTHUM, *Br. & Sch.*

*Orthotrichum phyllanthum*, Bryol. Europ. 3, Orthot. Monogr. p. 30, t. 18.

HAB. Cape Horn.

5. ORTHOTRICHUM LUTEOLUM, *Hook. fil. & Wils.*

*Orthotrichum luteolum*, Hook. fil. & Wils. in Flo. Antart. p. 97, t. 152, f. 2.

HAB.. Cape Horn.

6. ORTHOTRICHUM MAGELLANICUM, *Mont.*

*Orthotrichum Magellanicum*, Mont. in Voy. Astrol. & Zel. Crypt. p. 290, t. 20, f. 2.

HAB. Orange Harbor, Fuegia.

7. ORTHOTRICHUM CRASSIFOLIUM, *Hook. fil. & Wils.*

*Orthotrichum crassifolium*, Hook. fil. & Wils. in Flo. Antart. p. 125, t. 57, f. 8.

HAB. Cape Horn.

2. MACROMITRIUM, *Brid.*1. MACROMITRIUM REINWARDTII, *Schwægr.*

*Macromitrium Reinwardtii*, Schwægr. Suppl. 2, 2, p. 69, t. 173.

HAB. Kaala Mountains, behind Honolulu, Oahu; Mauna Loa, Hawaii; Sandwich Islands. Mountains of Tahiti, Society Islands.

2. MACROMITRIUM TONGENSE, *Sp. Nov.* (Tab. 5.)

*M. pusillum*; caule repente aphylllo; ramis confertis densissime foliosis subglobosis; foliis oblongo-ligulatis obtusis continuo-costatis inferne curvulo-areolatis papillosis, superne guttulatis; capsula cylindracea subcurvula longicolla breviter-pedicellata, peristomio simplici discrete 16-dentato; calyptra longa pilosa.

HAB. Tongatabu, one of the Friendly Islands.

Forms thin dense dark-brown patches. Stems creeping, divided, leafless; branches, very numerous, short, 1-2 lines high, densely leaved, subglobose. Leaves, oblong-ligulate, obtuse, apiculate by the slightly excurrent costa; the upper half plain, thick, opaque, composed of minute subrotund granular cellules; the lower half subcomplicate-concave, diaphanous, cellules large, oblong, lunate, papillose. Perichæatial leaves oblong-lanceolate, pointed, plicate; capsule cylindrical, erect, slightly curved, with a long collum: pedicel short, 1-1½ lines high: peristome single; teeth 16 equidistant, with a median line. Operculum long-rostrate. Calyptra covering the whole capsule, pilose.—Probably dioicous.

Resembles *M. Nepalense*; but that species has acuminate leaves, the

cellules in the lower part not curved: and the teeth of its peristome are in pairs.

PLATE 5, *B*.—MACROMITRIUM TONGENSE: fertile plants. Fig. 1. Portion of fertile plant. 2, 3, 4, 5, 6. Leaves. 7, 8. Portions of a leaf, showing the reticulation. 9, 10, 11. Cross sections of leaf. 12. Deoperculated capsule, with pedicel, perichætical leaves, and paraphyses. 13. Capsule, with operculum. 14. Same, without operculum. 15. Capsule, covered by calyptra. 16. Calyptra. 17. Cross section of same. 18. Hairs of the calyptra. 19. Three teeth of peristome, with portion of capsule wall. 20, 21. Perichætical leaves.—Details magnified.

### 3. MACROMITRIUM PILIFERUM, *Schwægr.*

*Macromitrium piliferum*, Schwægr. Suppl. 2, 2, p. 66, t. 172.

HAB. Kaala Mountains, Oahu; Mauna Loa, Hawaii; Sandwich Islands.

### 4. MACROMITRIUM GRACILE, *Hook.*

*Orthotrichum gracile*, Hook. Muse. Exot. t. 27.

*Macromitrium gracile*, Schwægr. Suppl. 2, 2, p. 39, t. 112.

HAB. New Zealand.

### 5. MACROMITRIUM SUBTILE, *Schwægr.*

*Macromitrium subtile*, Schwægr. Suppl. 2, 2, p. 140, t. 192.

HAB. Mountains of Tahiti, Society Islands. Savaii, one of the Navigator's Islands.

Appears to be common in Tahiti: the peristome very fugacious: inflorescence monoicous.



3. SCHLOTHEIMIA, *Brid.*1. SCHLOTHEIMIA NITIDA, *Schwægr.*

*Schlotheimia nitida*, Schwægr. Suppl. 2, 2, p. 5, t. 167.

HAB. Organ Mountains, Brazil. Specimens without fruit.

## Tribe II. GRIMMIEÆ.

1. GRIMMIA, *Ehrh.*1. GRIMMIA PERUVIANA, *Sp. Nov.* (Tab. 5.)

*G. dioica pulvinata*; caule fastigiato-ramoso; foliis erecto-patentibus lanceolatis carinato-concavis valido-costatis piliferis, pilo vix denticulato; capsula ovali macrostoma, collo distincto, pedicello breviusculo, peristom. dentibus pertusis; calyptra mitriformi lobata; floribus eparaphysatis.

HAB. Andes of Peru, at an elevation of 15,000 feet.

Resembles *G. leucophæa*, Grev. and may be a local form of that species. It differs, however, thus: the whole plant (the pellucid hair-point of the leaf excepted) is of a reddish-brown color; the stems are more branched and not clavate; the capsule is less inflated, less emergent, and has a wider mouth and a distinct collum; teeth of the peristome are not bifid or trifid; the pedicel is shorter; leaves are not so spreading and are not cymbiform-concave, neither is their hair-point strongly spinulose-dentate, nor their texture so thick.

PLATE 5, A.—GRIMMIA PERUVIANA: one male and two fertile plants. Fig. 1. Portion of fertile plant. 2, 3. Lower stem-leaves. 4, 5, 6. Upper and perichæatial leaves. 7. Point of leaf. 8, 9. Cross sections of leaf. 10, 11. Portions of leaf, showing the reticulation. 12, 13. Capsules, with calyptras, pedicels, and perichæatial leaves. 14. Capsule, with operculum. 15. Operculated capsule, with pedicel and vaginula. 16. The same in a dry state, without operculum. 17. Calyptra. 18. Two teeth of the peristome. 19. Vertical section through peristome,

annulus, and part of capsule wall. 20. Antheridia and perigonial leaves. 21. Perigonial leaf.—Details enlarged.

2. GRIMMIA OVATA, *Web. & Mohr.*

*Grimmia ovata*, Web. & Mohr; Bryol. Europ. 3, Grimm. Monogr. p. 21, t. 17.

HAB. Mauna Kea, Hawaii, Sandwich Islands.

3. GRIMMIA STREPTOPHYLLA, *Sp. Nov.* (Tab. 6.)

*G. monoica parvula laxe pulvinata; foliis dense imbricantibus spiraliter tristichis ovalibus oblongisve cymbiformi-concavis, perichaetialibus multo majoribus elongato-oblongis plicatis, omnibus obtusissimis subcontinuo-costatis; capsula immersa urniformi-ovali 16-dentata exannulata, operculo convexo umbonato; calyptra minima conica.*

HAB. Andes of Peru, near Bānos.

A rather small species, growing in loose blackish-brown cushions. Stems 8–10 lines high, fastigiately branched, radicles few. Leaves densely imbricate in three spiral rows, ovate or oblong, boat-shaped; the perichaetial much larger, elongated-oblong, plicate; all very obtuse, and with a costa reaching nearly to the apex; areolation minute, cellules quadrate above, oblong below. Capsule immersed, erect on a short straight pedicel, entirely concealed by the perichaetial leaves, oval, truncate, wide-mouthed, exannulate; teeth of the peristome lanceolate, obtuse, perforated, above yellowish. Operculum slightly convex, mamillate. Calyptra minute, conic. Monoicous; male buds large; perigonial leaves broad-ovate, constricted and subtubular at the apex; antheridia 10–15; paraphyses short and few.

PLATE 6, *B.*—GRIMMIA STREPTOPHYLLA: two fertile plants, of the natural size. Fig. 1. Portion of a plant, showing the spiral direction of the leaves. 2. The same, the perichaetial leaves opened to show the capsule. 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15. Leaves. 16, 17, 18, 19. Cross sections of leaf. 20. Portion of base of leaf, show-

ing the reticulation. 21, 22. Points of leaf, showing the same. 23. Cellules of leaf. 24. Capsules and antheridia. 25. Capsule and archegonia. 26. Calyptra. 27. Operculum, with columella adherent. Analyses magnified.

## 2. RACOMITRIUM, *Brid.*

### 1. RACOMITRIUM PROTENSUM, *Braun.*

*Racomitrium protensum*, Braun; Bryol. Europ. 3, Racom. Monogr. p. 6, t. 2.

HAB. Island of Madeira.

### 2. RACOMITRIUM RUPESTRE, *Hook. fl. & Wils.*

*Racomitrium rupestre*, Hook. fil. & Wils. Flo. N. Zeal. p. 75.

*Dryptodon rupestris*, Hook, fil. & Wils. Flo. Antaret. p. 402, t. 152, f. 1.

HAB. Orange Harbor, Fuegia.

### 3. RACOMITRIUM HETEROSTICHUM, *Brid.*

*Racomitrium heterostichum*, Brid.; Bryol. Europ. 3, Racom. Monogr. p. 9, t. 1.

HAB. Island of Madeira.

### 4. RACOMITRIUM LANUGINOSUM, *Brid.*

*Racomitrium lanuginosum*, Brid.; Bryol. Europ. 3, Racom. Monogr. p. 11, t. 6.

HAB. Island of Madeira. St. Jago, Cape de Verd Islands. Oregon. Orange Harbor, Fuegia. Hawaii and East Maui, Sandwich Islands.

### 5. RACOMITRIUM CANESCENS, *Brid.*

*Racomitrium canescens*, Brid.; Bryol. Europ. 3, Racom. Monogr. p. 12, t. 7 and 8.

HAB. Mount Rainier, Oregon.

## Tribe 12. POLYTRICHEÆ.

1. POLYTRICHUM, *Brid.*SUBGENUS 1. ATRICHUM, *Pal. Beauv.*

*Peristomii dentes* 32. *Capsula cylindrica inclinata. Operculum longirostre. Calyptra nuda, apice subspinulosa.*

1. POLYTRICHUM UNDULATUM, *Hedw.*

*Polytrichum undulatum*, Hedw. Stirp. 1, p. 43, t. 16.

*Atrichum undulatum*, Pal. Beauv.; Bryol. Europ. 4, Atric. Monogr. p. 8, t. 1 and 2.

HAB. Fort Nisqually, and Port Discovery, Oregon.

SUBGENUS 2. CYPHOMA, *Hook, fil. & Wils.*

*Peristomii dentes*, 64. *Capsula superne plana, inferne gibba. Calyptra, subnuda.*

2. POLYTRICHUM MAGELLANICUM, *Hedw.*

*Polytrichum Magellanicum*, Hedw. Sp. Musc. p. 101, t. 20; Flo. Antart. t. 59, f. 3; Flo. N. Zeal. p. 91.

HAB. Orange Harbor, Fuegia.

The subgenus *Cyphoma* with its character, is from the Flora of New Zealand. In our specimens (which are perhaps not in a fit state), the normal form of the capsule does not appear to be plano-convex. When much past maturity, the capsules become horizontal, and in consequence of the collapse of the wall of their upper side, sometimes assume nearly that form: even the figure above cited from the Flora Antarctica, favors this view.

SUBGENUS 3. PHALOCROMA, *Hook, fil. & Wils.*

*Peristomii dentes* 64. . . *Capsula teres.* *Calyptra parce pilosa.* *Ramificatio dendroidea.*

3. POLYTRICHUM DENDROIDES, *Brid.*

*Polytrichum dendroides*, *Brid.* *Musc. Recent.* 2, 1, p. 101, t. 5, f. 6; *Schwaegr. Suppl.* t. 151.

HAB. Orange Harbor, Fuegia.

4. POLYTRICHUM SQUAMOSUM, *Hook. fil. & Wils.*

*Polytrichum squamosum*, *Hook. fil. & Wils.* *Flo. Antart.* t. 153, f. 8.

HAB. Orange Harbor, Fuegia.

SUBGENUS 4. POGONATUM, *Pal. Beauv.*

*Peristomii dentes* 32–64. *Capsula teres.* *Calyptra Villosa.*

5. POLYTRICHUM ALPINUM, *Linn.*

*Polytrichum alpinum*, *Linn.* *Sp. Pl.* 1573.

*Pogonatum alpinum*, *Brid.*; *Bryol. Europ.* 4, *Pogon. Monog.* p. 9, t. 10.

HAB. New Zealand.

6. POLYTRICHUM SEMIANGULATUM, *Pers. (Tab. 6.)*

*Pogonatum semiangulatum*, *Pers.* in *Brid. Bryol. Univ.* 2, p. 744.

HAB. Organ Mountains, Brazil.

Our specimens accord accurately with authentic specimens of *P. semiangulatum*, Pers., which is clearly distinct from *P. Magellanicum*, to which it has been referred by late authors. Besides other characters less striking, its more linear obtuse leaves with a bright orange-red spot on the upper part of their sheathing base, at once distinguish it from *P. Magellanicum*.

PLATE 6, 4.—POLYTRICHUM SEMIANGULATUM: two plants, of the natural size. Fig. 1, 2, 3. Leaves. 4. Cross section of sheathing base of leaf. 5, 6, 7. Cross sections of the blade of the leaf, showing the lamellæ. 8. Portion of upper part of sheathing base of leaf, showing the reticulation. 9, 10, 11, 12. Capsules. 13. Peristome with portion of capsule wall. 14. Four teeth of the peristome.—Details magnified.

7. POLYTRICHUM TORTILE, Swartz.

*Polytrichum tortile*, Swartz. Flo. Ind. Oce. 3, p. 1839; Flo. N. Zeal. p. 96.

HAB. New Zealand.

It is not certain that this is the true Swartzian *P. tortile*. Our plant is the same as the one so named by Hooker and Wilson in the Flora of New Zealand.

8. POLYTRICHUM JUNGHUHNIANUM, Dz. & Mb.

*Polytrichum Junghuhnianum*, Dz. & Mb. Bryol. Javan. p. 41, t. 31.

HAB. Hawaii, Sandwich Islands.

SUBGENUS 5. CEPHALOTRICHUM, Schimp.

*Peristomii dentes* 16. *Capsula teres elongata. Calyptra villosa. Folia rosulato-congesta.*

9. POLYTRICHUM OLIGODUS, *Kunze.*

*Polytrichum oligodus*, Kunze.; Mühl. Synop. Musc. Frond. 1, p. 206.

HAB. Andes of Peru, at an elevation of 15,000 feet.

SUBGENUS 6. POLYTRICHUM, *Brid.*

*Peristomii dentes* 64. *Capsula angulata discoideo-apophysata. Calyptra villosa.*

10. POLYTRICHUM COMMUNE, *Linn.*

*Polytrichum commune*, Linn. Sp. Pl. p. 1573; Bryol. Europ. 4, Polyt. Monog. p. 13, t. 17.

HAB. New Zealand.

11. POLYTRICHUM JUNIPERINUM, *Hedw.*

*Polytrichum Juniperinum*, Hedw. Sp. Musc. p. 89, t. 13; Bryol. Europ. 4, Polyt. Monog. p. 12, t. 16.

HAB. New Zealand; Island of Madeira; Oregon.

12. POLYTRICHUM PILIFERUM, *Schreb.*

*Polytrichum piliferum*, Schreb. Fl. Lips. p. 74; Bryol. Europ. 4, Polyt. Monog. p. 11, t. 14.

HAB. Island of Madeira.

## Tribe 13. BRYEÆ.

1. BRYUM, *Dill.*1. BRYUM GIGANTEUM, *Hook.*

*Bryum giganteum*, Hook. in Schwæg. Suppl. 2, 2, p. 20, t. 158.

HAB. Kaala Mountains, Oahu, Sandwich Islands. Specimens barren.

2. BRYUM TRUNCORUM, *Brid.*

*Bryum truncorum*, Brid. Bryol. Univ. 1, p. 699; Flo. New Zeal. p. 86.

HAB. New Zealand.

3. BRYUM MEGALOSTEGIUM, *Sp. Nov.* (Tab. 7.)

*B. dioicum dense cæspitans; foliis ovato-lanceolatis costa excurrente breviter cuspidatis, marginibus integerrimis planis; capsula clavato-pyriformi incurva nutante vel pendula late annulata pachydermi macrostoma; operculo permagno subhemisphærico apiculato.*

HAB. Forests on the sides of Mauna Loa, Hawaii, Sandwich Islands.

Tufts dense, of a shining yellow color. Stems radiculose, purplish-brown below, rather slender, 1–2 inches high, with one or two short innovations from the apex. Leaves ovate-lanceolate, concave, distant except at the top where they are crowded, oblong-acuminate and sub-linear-lanceolate; all sharply cuspidate by the excurrent costa, their margins entire plain, not bordered; texture thin, soft, composed of elongated hexagonal cellules. Capsule clavate-pyriform, incurved, cernuous or pendulous, thick-walled, mouth very large, collum about the length of the sporangium, tapering into the pedicel; cilia of the



inner peristome broad, split on the keel, ciliolæ in pairs, appendiculate; annulus broad. Operculum unusually large, subhemispherical, apiculate. Dioicous.

*B. pallens*, Swartz, and *B. turbinatum*, Hedw., associate closely with this species: the first, however, has decurrent leaves with a thickened recurved border; the second has a symmetrical straight capsule; in both the operculum is much smaller than in *B. Megalostegium*.

PLATE 7, A.—BRYUM MEGALOSTEGIUM: four plants, of the natural size. Fig. 1. A plant. 2. Perichæatial leaves. 3, 4, 5, 6, 7, 8. Stem leaves. 9. Cross section of leaf. 10. Portion of base of leaf, showing the reticulation. 11. Point of leaf, showing the same. 12, 13, 14, 15. Capsules. 16. Portion of the peristome. 17. Vertical section of the peristome. 18. Points of teeth of same. 19. Vaginal with archegonia and paraphyses.—Details magnified.

#### 4. BRYUM AUBERTI, *Brid.*

*Bryum Auberti*, Brid. Bryol. Univ. 1, p. 711; Schwægr. Suppl. 1, 2, p. 132, t. 80.

HAB. Feejee Islands. The specimens, though scanty and imperfect, accord well with Schwægrichen's figure above cited.

#### 5. BRYUM NIVALE, *C. Mull.*

*Bryum nivale*, C. Müll. Synop. Musc. 1, p. 262.

HAB. Casa Cancha, Peru. Snow-line of the Cordilleras, near Santiago, Chili.

#### 6. BRYUM CÆSPITICIUM, *Linn.*

*Bryum cæspiticium*, Linn. Sp. Pl. 1586; Bryol. Europ. 4, Bry. Monog. p. 70, t. 34.

HAB. Sandwich Islands.

7. BRYUM ALPINUM, *Linn.*

*Bryum alpinum*, Linn. Syst. Plant. p. 949; Bryol. Europ. 4, Bry. Monog. p. 76, t. 39.

HAB. Island of Madeira.

8. BRYUM ARGENTEUM, *Linn.*

*Bryum argenteum*, Linn. Sp. Pl. p. 1586; Bryol. Europ. 4, Bry. Monog. p. 78, t. 41.

HAB. High Andes of Peru. The specimens belong to the *var. lanatum*.

9. BRYUM INDICUM, *Dz. & Molkb.*

*Bryum Indicum*, Dz. & Molkb. Musc. Frond. Ined. Arch. Ind. p. 22, t. 11.

*Peromnion Magellanicum*, Sulliv. in Hook. Jour. Bot. 2, p. 316.

HAB. Hawaii, Sandwich Islands. Mountains of Tahiti. "Cape Horn." The last habitat is probably erroneous.

10. BRYUM JULACEUM, *Smith.*

*Bryum julaceum*, Smith, Flo. Brit. p. 1357; Bryol. Europ. 4, Bry. Monog. p. 79, t. 40.

HAB. Andes of Peru. The specimens are without fruit, but appear to belong to this species.

11. BRYUM OREGANUM, *Sp. Nov.* (Tab. 7.)

*B. hermaphroditum*; *cæspite denso*; *caulibus ramisque brevissimis gemmiformibus*; *foliis confertissimis oblongis obovato-oblongisve acutis margine limbato superne serrato reflexis continuo-costatis*; *capsula alte pedicellata subpendula clavato-oblonga, operculo hemisphærico apiculato.*

HAB. Oregon.

Hermaphrodite. Densely caespitose. Stems and innovations very short, 4–5 lines high, gemmiform. Leaves crowded into a subglobose tuft, oblong or obovate-oblong, pointed, serrate above; margins reflexed, bordered; costa extending to the point; areolation rather loose, cellules rhombic: perichaetial leaves elongated-oblong, long-pointed, with a subexcurrent costa. Capsule subpendulous, clavate-oblong, straight or slightly curved, constricted below the mouth when dry: teeth of the peristome closely articulated; cilia broad with large perforations on the keel; ciliolæ in pairs, conspicuously appendiculate; annulus large, compound; operculum rather small, hemispherical, apiculate; pedicel slender, 1–2 inches high.

This species is closely related to *Bryum microstegium*, Schimp., but that has ovate-lanceolate leaves gradually acuminate and long-cuspidate by the excurrent costa, with margins not reflexed; a convex-conic more pointed and much smaller operculum; and more linear peristomial teeth with more distant articulations.

PLATE 7, *B*.—*BRYUM OREGANUM*: three plants, of the natural size. Fig. 1. A plant. 2, 3, 4, 5, 6. Leaves. 7. Cross section of leaf. 8. Leaf, showing the reticulation. 9. Marginal portion of leaf, showing the same. 10, 11, 12, 13, 14. Capsules. 15. Portion of peristome. 16. Vertical section of peristome. 17. Portion of annulus. 18. Vaginula, with antheridia and archegonia. 19. Archegonia, antheridium, and paraphysis.—Details magnified.

## 12. *BRYUM LÆVIGATUM*, *Hook. fil. & Wils.*

*Bryum lævigatum*, Hook. fil. & Wils. Flo. Antaret. p. 415, t. 154, p. 3.

HAB. Orange Harbor, Fuegia.

## 13. *BRYUM NUTANS*, *Schreb.*

*Bryum nutans*, Schreb. Spic. Flo. Lips. p. 81; Bryol. Europ. 4, Bry. Monog. p. 34, t. 12.

HAB. Cape Horn.

14. BRYUM VAGANS, *Hook. fl. & Wils.*

*Bryum vagans*, Hook. fl. & Wils. Flo. Antarct. t. 154, f. 1.

HAB. Orange Harbor, Fuegia. Of this and the two preceding species the collection contains very imperfect specimens, barely sufficient for their identification.

2. MNIMUM, *Linn.*1. MNIMUM PUNCTATUM, *Hedw.*

*Mnium punctatum*, Hedw. Sp. Musc. p. 193; Bryol. Europ. 4, Mn. Monog. p. 19, t. 2.

HAB. Port Discovery, Oregon.

2. MNIMUM INSIGNE, *Mitten.*

*Mnium insigne*, Mitten. in Hook. Jour. Bot. 8, p. 230.

HAB. Puget Sound, Oregon.

3. MNIMUM ROSTRATUM, *Schwægr.*

*Mnium rostratum*, Schwægr. Suppl. 1, 2, p. 136, t. 79; Bryol. Europ. 4, Mni. Monogr. p. 27, t. 7.

HAB. Hawaii, Sandwich Islands. Tahiti, Society Islands.

4. MNIMUM RHYNCHOPHORUM, *Hook.*

*Mnium rhynchophorum*, Hook. Ic. Pl. t. 20, f. 3.

HAB. Forests on the side of Mauna Loa, Hawaii, Sandwich Islands.

5. MNIMUM VENUSTUM, *Mitten.*

*Mnium venustum*, Mitten. in Hook. Jour. Bot. 8, p. 231, t. 12, f. B.

HAB. Port Discovery, Oregon.

6. MNIMUM MENZIESII, *Hook.*

*Bryum Menziesii*, Hook. Bot. Miscell. 1, p. 36, t. 19.

*Hypnum acanthoneuron*, Schwægr. Suppl. t. 258.

HAB. Port Discovery and Puget Sound, Oregon.

3. AULACOMNION, *Schwægr.*1. AULACOMNION ANDROGYNUM, *Schwægr.*

*Aulacomnion androgynum*, Schwægr. Suppl. t. 125; Bryol. Europ. 4, Aulac. Monogr. p. 11, t. 4.

HAB. Fort Nisqually, Puget Sound, Oregon. The specimens are somewhat larger than the European, and fruit more copiously.

4. MEESIA, *Hedw.*1. MEESIA LONGISETA, *Hedw.*

*Meesia longiseta*, Hedw. Stirp. Crypt. 1, t. 21, 22; Bryol. Europ. 4, Mees. Monog. p. 6, t. 2.

HAB. Oregon. A mere scrap, found among other mosses.

5. LEPTOSTOMUM, *R. Brown.*1. LEPTOSTOMUM MENZIESII, *R. Br.*

*Leptostomum Menziesii*, R. Br. in Act. Soc. Linn. Lond. 10, p. 320; Schwægr. Suppl. t. 104.

HAB. Orange Harbor, Fuegia. Our specimens furnish the male plants, hitherto unknown. They are simple, clavate, mixed with and smaller than the fertile plants: male flower terminal subdiscoid; antheridia numerous; paraphyses filiform.

2. LEPTOSTOMUM MACROCARPUM, *Hedw.*

*Bryum macrocarpum*, Hedw. Musc. Frond. 3, p. 28, t. 10.

HAB. New Zealand.

## Tribe 14. MIELICHHOFERIÆ.

1. MIELICHHOFERIA, *Nees & Hornsch.*1. MIELICHHOFERIA ANDINA, *Sp. Nov.* (Tab. 8.)

*M. hermaphrodita pusilla; cæspite densa; caulibus innovando-ramosis clavatis; foliis densissime imbricatis lanceolatis acuminatis superne serratis evanido-costatis bryoideo-areolatis; capsula ovali-cylindrica recta vel curvata brevicolla annulata pendula conico-operculata, pedicello longiusculo flexuoso, perist. dentibus tenuibus linearibus remote articulatis.*

HAB. Andes of Peru, at an elevation of 15,000 feet.

A small hermaphrodite species, growing in dense tufts. Stems 4-6 lines high, fastigiately branched by subclavate innovations. Leaves

closely crowded on the upper half of the innovations, below scattered and smaller, lanceolate acuminate, serrate from the middle upwards, areolation loose elongated-hexagonal, costa subflexuous, vanishing below the apex; perichætical leaves longer and with a shorter costa. Capsule oval-cylindrical, straight or arcuate, cernuous or pendulous; collum short, not tapering into the rather long and flexuous pedicel; annulus simple, large; operculum short, conic; teeth of the peristome tender, linear, horizontal, remotely articulated; spores large. Antheridia in the axils of the perichætical leaves, or mixed with the archeogonia at the base of the vaginula.

The small size of the whole plant, and its short oval-cylindrical capsule with a broad short abrupt collum, distinguish this species from its congeners.

PLATE 8. *A.*—MIELICHHOFERIA ANDINA: four plants, of the natural size. Fig. 1. A plant. 2, 3, 4, 5, 6. Leaves. 7, 8, 9. Cross sections of leaves. 10. Leaf, showing the reticulation. 11, 12. Capsules, without opercula. 13. Capsule, with operculum. 14. Peristome, with portion of capsule wall. 15. Three teeth of peristome, with portion of annulus, and spores. 16. A spore. 17. Vaginula, with archegonia and antheridia. 18. Antheridium.—Analyses enlarged.

#### Tribe 15. BARTRAMIEÆ.

##### 1. BARTRAMIA, *Hedw.*

##### 1. BARTRAMIA RIGIDA, *Bals. & Not.*

*Bartramia rigida*, Bals. & Not. Pugil. 1; Bryol. Europ. 4; Bart. Monogr. p. 20, t. 11.

HAB. Base of Mauna Kea, Hawaii, Sandwich Islands.

The specimens differ from the European only in their larger size. The American representative of this species is *B. radicalis*, Beauv., distinguished mainly by a more linear leaf, a longer and more slender pedicel, and a smaller capsule.

2. BARTRAMIA TENUIS, *Tayl.*

*Bartramia tenuis*, Tayl. in Phytologist, p. 1095.

*Bartramia mollis*, Dz. & Molkb. in Ann. Sci. 1844, 2, p. 300.

*Bartramia radicalis*, Hook. fil. & Wils. Flo. N. Zeal., not Beauv.

HAB. New Zealand, Waya-ruru Bay; growing with *Marchantia paleacea*.

Authentic specimens, under the three names above, prove to be one and the same species. It is doubtful which of the two first specific names is entitled to adoption; both appear to have been published during the latter part of 1844. This species is dioicous. The true *B. radicalis*, Beauv., very common in the Southern United States, is monoicous, its staminate and pistillate buds being in close proximity, as in *B. pomiformis*.

3. BARTRAMIA ELEGANTULA, *Tayl.*

*Bartramia elegantula*, Tayl. in Lond. Jour. Bot. 1847, p. 335.

HAB. Near the snow-line behind St. Jago, Chili.

4. BARTRAMIA EXIGUA, *Sulliv.* (Tab. 8.)

*B. dioica pusilla*; *caulibus dendroideo-ramosis; foliis caulinis ovato-lanceolatis, rameis anguste lanceolatis, omnibus costa excurrente longe cuspidatis valde papillosis, margine subrecurvo celluloso-denticulatis minute quadrato-areolatis: flore masculo terminali disciformi, foliis perigonalibus obtusatis apice dentatis evanido-costatis: fl. fem. et fr. desideratis.*

*Bartramia pusilla*, Sulliv. in Hook. Jour. Bot. 1850, p. 316.

HAB. Cape Horn.



A small glaucous-green species, of which the Collection contains only male and barren specimens. Stems erect, about 1 inch high, matted together below by dark tomentose radicles, subdendroid, having from near the summit numerous spreading branches 2-3 lines long. Leaves of the main stems erect ovate-lanceolate, those of the branches narrower spreading, both mucronate by the excurrent costa, concave, subcarinate, strongly papillose on both sides, opaque, denticulate on the slightly recurved margins by protuberant oblong cellules, which elsewhere are smaller and subquadrate. Male flower terminal, discoid; perigonial leaves with a costa ceasing below the obtuse and dentate apex; antheridia numerous, shorter than the clavate paraphyses.

Clearly different from *Glyphocarpa pusilla*, Hook. fil. & Wils., to which it is referred by Muller, Synop. Musc. 2, p. 616. *G. pusilla* is described (Lond. Jour. Bot. 1844, p. 545) as "being exceedingly minute, the whole plant not two lines in height, and with loosely reticulated leaves."

Barren stems of *B. exigua* very much resemble *Hypnum Scabrifolium*, Hook. fil. & Wils., as figured in the Flora Antarctica, Tab. 60.

PLATE 8, *B.*—*BARTRAMIA EXIGUA*: one barren and two male plants, of the natural size. Fig. 1. A male plant. 2, 3, 4. Stem leaves. 5, 6, 7. Branch leaves. 8, 9, 10. Perigonial leaves. 11, 12, 13. Cross sections of branch leaves. 14. Upper part of a branch leaf, showing the reticulation. 15, 16. Cellules of same. 17. Portion of a branch. 18, 19. Antheridium and paraphyses.—Details enlarged.

#### 5. *BARTRAMIA SETIFOLIA*, Hook. & Arn.

*Gymnostomum setifolium*, Hook. & Arn. in Hook. Icon. Plant. t. 135.

HAB. Near Casa Cancha, Andes of Peru.

The specimens vary in important particulars from the description of *Bartramia intertexta*, Schimp., as given in Muller's Synop. Musc. 1, p. 504, under which *G. setifolium*, H. & A., is cited as a synonym.

6. BARTRAMIA PATENS, *Brid.*

*Bartramia patens*, Brid. Bryol. Univ. 2, p. 38 ; Schwægr. Suppl. t. 62.

HAB. Orange Harbor, Fuegia.

7. BARTRAMIA INTEGRIFOLIA, *Tayl.*

*Bartramia integrifolia*, Tayl. in Lond. Jour. Bot. 1846, p. 55.

HAB. Cape Horn.

8. BARTRAMIA ROBUSTA, *Hook. fil. & Wils.*

*Bartramia robusta*, Hook. fil. & Wils. Flo. Antaret. p. 21, t. 59, f. 4.

HAB. Orange Harbor, Fuegia.

9. BARTRAMIA PENDULA, *Hook.*

*Bartramia pendula*, Hook. Muse. Exot. t. 21 ; Schwægr. Suppl. t. 239.

HAB. Cape Horn, Fuegia.

2. CONOSTOMUM, *Swartz.*1. CONOSTOMUM AUSTRALE, *Swartz.*

*Conostomum australe*, Swartz. in Schrad. Neu. Bot. Jour. p. 134, t. 1, f. 3.  
*Bartramia Conostoma*, Bryol. Europ. 4, Bart. Monogr. p. 16, t. 7.

HAB. Orange Harbor, Fuegia.

2. CONOSTOMUM MAGELLANICUM, *Sulliv.* (Tab. 8.)

*C. monoicum caespitosum; caulibus gracilibus dense foliosis innovando-ramosis; foliis quinquefariis arcte (in sicco vel humido) appressis lævibus oblongo-ovatis obtusis quadrato-areolatis, costa latissima subapice desinente; floribus terminalibus masculo disciformi fœmineo capituliformi, perichætalibus oblongo-acuminatis excurrenti-costatis: fructu non viso.*

*Conostomum Magellanicum*, Sulliv. in Hook. Jour. Bot. 1850, p. 316.

HAB. Orange Harbor, Fuegia. Specimens without fruit.

Monoicous: stems caespitose, radiculose below and at the base of the innovations, slender,  $1\frac{1}{2}$  inches high, branched by innovations, densely leafy, subjulaceous. Leaves crowded, appressed in a dry or moist state, indistinctly 5-ranked, oblong-ovate, obtuse, moderately concave, subcarinate, entire, smooth; areolation rather large, quadrate; costa broad, predominant, ceasing a little below the apex. Flowers terminal; the male disciform; antheridia numerous, shorter than the clavate paraphyses; the fertile capituliform; archegonia slender, with filiform paraphyses. Perichætal leaves oblong, acuminate, cuspidate by the excurrent costa.

PLATE 8, *C.*—CONOSTOMUM MAGELLANICUM: plants, of the natural size. Fig. 1. A plant. 2, 3, 4. Stem-leaves. 5, 6, 7. Perigonial leaves. 8. Perichætal leaf. 9. Upper part of stem-leaf, showing the reticulation. 10. Cross section of leaf. 11. Archegonia and paraphyses. 12. Same. 13. Antheridium and paraphyses.—Details magnified.

## Tribe 16. FUNARIEÆ.

1. FUNARIA, *Schreb.*1. FUNARIA HYGROMETRICA, *Hedw.*

*Funaria hygrometrica*, Hedw. Sp. Musc. p. 172; Bryol. Europ. 3, Funar. Monogr. p. 8, t. 3.

HAB. New Holland; Sandwich Islands; Oregon; New Zealand.

2. FUNARIA CALVESCENS, *Schwægr.*

*Funaria calvenscens*, Schwægr. Suppl. 1, 2, p. 77, t. 65.

HAB. Peru.

## Tribe 17. SPLACHNEÆ.

1. ORTHODON, *Bory.*1. ORTHODON SERRATUS, *Bory.*

*Orthodon serratus*, Bory. in Schwægr. Suppl. 2, 1, p. 23, t. 106, non Brid. Bryol. Univ. 1, p. 232.

*Octoblepharum serratum*, Brid. Sp. Musc. p. 86?, non Hook. Musc. Exot. t. 136.

*Dissodon serratus*, C. Müll. Synop. Musc. Frond. 1, p. 141.

*Orthodon subglaber*, Griffith Musc. Itin. Assam. p. 19.

HAB. Forest on sides of Mauna Kea, Hawaii, Sandwich Islands.

Our specimens are identical with Isle of Bourbon specimens received, under the name of *Orthodon serratus*, Bory, from Schwægrichen: they, however, do not accord with his description and figure l. c. of that species.

The detailed description of *Orthodon subglaber*, Griffith, in the Muscologia Itineris Assamici, applies accurately to our moss: the same may be said of Muller's *Dissodon serratus*.

*Octoblepharum serratum*, Hook., is usually considered the same as *Orthodon serratus*, Bory., but the serration of the leaf, and the structure of the calyptra of the former, as figured in Musc. Exot. t. 136, preclude this view.

Bridel's *Octoblepharum serratum*, Sp. Musc., may be the true *Orthodon serratus*, Bory.; not so his *Orthodon serratus* (Bryol. Univ.), which conforms to t. 136, just cited.

## Div. 2. PLEUROCARPI.

## Tribe 18. HYPNEÆ.

1. HYPNUM, *Linn.*

*Sec. 1. Dendroidea: caulis primarius radiceformis, secundarius erectus, inferne nudus, superne arbusculoideo-ramosus.*

† *Folia immarginata.*

*a, Capsula lævis.*

1. HYPNUM ARBUSCULA, *Hook.*

*Hypnum Arbuscula*, Hook. Musc. Exot. t. 112; Müll. Synop. Musc. Frond. 2, p. 228.

HAB. Bay of Islands, New Zealand. Peru.

2. HYPNUM MENZIESII, *Hook.*

*Hypnum Menziesii*, Hook. Musc. Exot. t. 33; Müll. Synop. Musc. Frond. 2, p. 506.

HAB. Bay of Islands, New Zealand.

3. HYPNUM REINWARDTI, *Hsch.*

*Hypnum Reinwardti*, Hsch. Nov. Act. Acad. Cæs. Leop. 14, 2, Suppl. p. 722, t. 41;  
Müll. Synop. Musc. Frond. 2, p. 505.

HAB. Island of Tutuila, Samoan or Navigator's Group. Ovolau, Feejee Islands.

4. HYPNUM FASCICULATUM, *Sw.*

*Hypnum fasciculatum*, Swartz. Prodr. Flo. Ind. Occ. p. 140; Müll. Synop. Musc. Frond. 2, p. 226; Hedw. Sp. Musc. p. 245, t. 62.

HAB. Organ Mountains, Brazil; without fruit.

*b. Capsula sulcata.*

5. HYPNUM COMOSUM, *La Bill.*

*Hypnum comosum*, La Bill. Pl. Nov. Holl. 2, p. 107, t. 253, f. 2; Müll. Synop. Musc. Frond. 2, p. 503.

HAB. New Zealand. Lord Auckland's Islands. A variable species.

6. HYPNUM DIVARICATUM, *Hsch. & Reinw.*

*Hypnum divaricatum*, Hsch & Reinw. Nov. Act. Acad. Cæs. Leop. 14, 2, Suppl. p. 722, t. 41; Müll. Synop. Musc. Frond. 2, p. 505.

HAB. Mountains of Tahiti, Society Islands.

This species, *H. comatum*, Müll., and *H. Sieberi*, Müll., may be forms of the preceding species.

7. HYPNUM SPININERVIUM, *Hook.*

*Hypnum spininervium*, Hook. Musc. Exot. t. 29; Müll. Synop. Musc. Frond. 2, p. 506.

*Hypnum arcuatum*, Hedw. e. Mitten in Hook. Jour. Bot. 1856, p. 265.

HAB. Tahiti and Eimeo, Society Islands.

†† *Folia plus minus marginata.*

8. *HYPNUM MARGINATUM*, *Hook. fil. & Wils.*

*Hypnum marginatum*, Hook. fil. & Wils. Lond. Jour. Bot. 3, p. 554; Flo. N. Zeal. p. 106, t. 89, f. 2.

HAB. Bay of Islands, New Zealand.

9. *HYPNUM TRICOSTATUM*, *Sulliv.* (Tab. 9.)

*H. dioicum, majusculum, dendroideo-ramosum; ramis elongatis flexuosis simplicibus compositisve; foliis confertis erecto-patentibus ovato-oblongis acutis continuo-costatis incrassate limbatis (veluti tricostatis) superne grosse serratis subpunctiformi-areolatis; perichætiis polyphyllis ramigenis.*

*Neckera tricostata*, Sulliv. in Proceed. Amer. Acad. Art. Sci. (Jan. 1854.)

HAB. Hawaii, Sandwich Islands.

A striking, showy, dendroid species, with brownish-yellow foliage. Main stem creeping horizontal, throwing up at intervals erect branches, 5 to 7 inches high, which below are simple, blackish, shining, and leafless; above, divided into numerous crowded, elongated, flexuose, simple, and compound branchlets. Leaves imbricating, erect-patent, slightly incurved, ovate-oblong, acuminate, with a broad subtruncate base, serrate above, concave, carinate, costate their entire length; the margins surrounded by a thickened border, similar to the costa; compactly areolated, the cellules minute, subrotund. Perichætia situated at the base of the branchlets, oblong; the leaves numerous, closely imbricating; the lower ones broad-ovate, more or less apiculate; the upper, oblong, convolute, with horizontally reflexed acuminate points; all ecostate, their margins with a more or less distinct pellucid border. Archegonia numerous, 45–50. Paraphyses copious, longer than the archegonia, formed of about 30 oblong cellules, placed end to end, the base in some composed of several strata of cellules. Probably dioicous.

PLATE 9, *B.*—HYPNUM TRICOSTATUM: plant, of the natural size. Fig. 1. A portion of the stem, with leaves. 2, 3, 4. Leaves. 5, 6. Cross sections of a leaf. 7. Point of a leaf, showing the reticulation. 8. Marginal portion of leaf, showing the same. 9. Perichæcium. 10, 11, 12. Perichæcial leaves. 13. Archegonium and paraphyses.—Details magnified.

10. HYPNUM SPECIOSISSIMUM, *Sulliv.* (Tab. 9.)

*H. dioicum, elatum, frondiforme; caule secundario erecto inferne subnudo stipiformi superne pinnato-ramoso; foliis lineari-lanceolatis longissime acuminatis costa dorso superne dentata excurrente cuspidatis supra medium serratis indistincte limbatis dense lineari-areolatis; perigoniiis (planta mascula sola visa) numerosissimis conspicuis.*

*Hypnum speciosissimum*, Sulliv. Proceed. Amer. Acad. Art. Sci. (Jan. 1854.)

HAB. Feejee Islands.

A large striking plant, of a fern-like aspect: light chestnut the predominant color of the foliage. Male plants only, seen. Primary stem or rhizoma large, prostrate, covered with dark-purple radicles. From the rhizoma arise erect stems, 7–8 inches high; their lower half a firm, stiff, blackish stipe, apparently naked, but furnished with scattered, closely appressed, scale-like leaves; their upper half throwing out equally on both sides, and in the same plane, numerous crowded branches; the branches patent-divergent; the upper ones straight, simple; the lower more or less flexuous, with a few short branchlets. Leaves of the central stem, large, distant, bifarious, triangular-lanceolate, long-acuminate, slightly concave: leaves of the branches and branchlets much narrower, erect-patent, crowded, from an oblong elliptical base, produced into a very long linear point, four times the length of the base: both kinds of leaves acutely serrate above, cuspidate by a firm, rigid, excurrent costa, dentate on the back near its apex; their margins more or less thickened; areolation opaque, dense, very minute; cellules pachydermous, linear, tapering at each end. Male flowers numerous, large, conspicuous, ellipsoidal, acuminate, sub-



stipitate, disposed in lines upon the upper branches and upper portion of the main stem: the lower perigonal leaves minute, ovate, pointed; the upper ones convolute, lanceolate, filiformly acuminate, costate to the apex; the interior ones broad, elliptical, convolute, shortly and obtusely apiculate; costa vanishing midway. Antheridia 3-5 large, elongated, pedicelled: paraphyses more numerous, and a little longer than the antheridia.

PLATE 9, A.—HYPNUM SPECIOSISSIMUM: plant, of the natural size. Fig. 1. Portion of the erect stem, with a branch. 2, 3, 4. Leaves of the stem. 5. Leaf of a branch. 6. Cross section of a leaf. 7, 8. Portion of the base of a leaf, showing the reticulation. 9. Point of a leaf. 10. Portion of the apparently naked stem. 11. Male bud in the axil of a branch leaf. 12. The same, detached. 13, 14. Antheridia, with paraphyses. 15, 16, 17, 18. Leaves of the perigonium.—Details enlarged.

Sec. 2. *Cupressiformia*: *caulis prostratus vage vel sæpius pinnatim ramulosus*; *folia obsolete breviter bicostata plus minus falcato-secunda*.

† *Capsula cernua vel erecto-cernua inæqualis*.

# 11. HYPNUM CUPRESSIFORME, Linn.

*Hypnum cupressiforme*, Linn. Sp. Pl. p. 1592; Bryol. Europ. 6, Hyp. Monogr. p. 25, t. 14.

HAB. Island of Madeira. New Zealand.

# 12. HYPNUM CHRYSOGASTER, C. Müll.

*Hypnum chrysogaster*, C. Müll. Synop. Musc. Frond. 2, p. 255. (1851.)

*Hypnum cupressiforme*, Hook. f. & Wils. in Sched. Musc. Antarct. (1853.)

*Hypnum patale*, Hook. fil. & Wils. in Flo. New Zeal. p. 112, t. 90, f. 6. (1855.)

HAB. New Zealand.

13. HYPNUM DECURRENS, *Sulliv.* (Tab. 10.)

*H. dioicum, majusculum*; caulibus prostratis subcomplanatis parce pinnatim ramosis; foliis subfulcatis cordato-lanceolatis tenuiter acuminatis decurrentibus toto ambitu serratis brevissime bicostatis, cellulis tenuissimis linearibus alaribus magnis subquadratis; capsula cernua gibboso-oblonga; pedicello erecto-flexuoso.

*Hypnum decurrens*, Sulliv. in Proceed. Amer. Acad. Art. Sci. (Jan. 1854.)

HAB. Kaala Mountains, Oahu, Sandwich Islands.

Probably dioicous; a large species growing in loose shining yellowish mats. Stems prostrate, mostly simple, 4–5 inches long and about one line broad, somewhat compressed, pinnated with distant branches of unequal lengths. Leaves loosely imbricating from a broad, cordate, auriculate, decurrent base, lanceolate-attenuate, serrulate, secund, subfalcate, subecostate, of a firm and thin texture composed of minute and linear cellules; those at the basal angles large, pellucid, and subquadrate. Perichætia numerous: the exterior leaves ovate oblong acuminate; the interior oblong, terminating in a long flexuous, denticulate, strap-shaped point; all destitute of a costa. Archegonia 35–40, copiously paraphysated. Pedicels (two only seen, and they grew from the same perichætium) erect, flexuous, smooth, rather short in proportion to the size of the plant. Capsule horizontal, short, hypnoid.

This species strongly resembles the North American *Hypnum curvifolium*, Hedw., but the latter species has larger perichætia with whitish striated leaves, and a capsule when dry conspicuously sulcate.

PLATE 10, B.—HYPNUM DECURRENS: plant, of the natural size. Fig. 1. Portion of stem, with leaves. 2, 3, 4, 5, 6. Leaves. 7, 8, 9. Portions of a leaf, showing the reticulation. 10. Capsule. 11. Archegonium and paraphysis. 12. Perichætium. 13, 14, 15. Perichætial leaves.—Details enlarged.

14. *HYPNUM OPÆODON*, *Sulliv.* (Tab. 11.)

*H. dioicum*, late cæspitans; caulibus prostratis pinnatis; foliis subfalcato-secundis ovato-lanceolatis acuminatis serrulatis ecostatis tenuiter lineari-areolatis, cellulis alaribus permagnis; capsula oblonga subinæquali erecta abrupte brevicolla; perist. dentibus lineali-lanceolatis fenestratis ad latera sinuato-dentatis; operculo conico breviter rostrato.

*Hypnum opæodon*, Sulliv. in Proceed. Amer. Acad. Art. Sci. (Jan. 1854.)

HAB. Forest at the Eastern base of Mauna Kea, Hawaii, Sandwich Islands.

Stems rather short, prostrate, forming large dense golden yellow shining mats. Ramification at right angles: main branches evenly and closely pinnate, occasionally subbipinnate. Leaves crowded, ovate-lanceolate, acuminate, serrulate, estriate, subfalcate-secund, ecostate or obsoletely biscopate at base: texture membranous but firm, composed of minute linear cellules, except at each of the basal angles, where are three or four large, oblong, inflated, and yellowish. Perichaetium elongated; leaves numerous, ovate and oblong, sheathing, ecostate, striate, produced into long, variously directed, and strongly dentate points. Paraphyses abundant. Pedicel smooth, erect, flexuose, slender, much twisted when dry,  $1\frac{1}{2}$  to 2 inches long. Capsule subcylindrical-oblong, erect, slightly curved on one side, with a subglobose collum not tapering into the pedicel, mouth oblique, exannulate. Operculum moderately rostrate from a conic base. Teeth of the peristome linear-lanceolate with three or four large irregular openings (hence the specific name) along the axis: the sides of the teeth strongly and irregularly crenate-dentate: cilia lanceolate, carinate, more or less ruptured along the keel; the basal membrane rather narrow: ciliolæ rudimentary. Sporules large.

The general appearance of this species is strikingly similar to that of *Hypnum imponens*, Hedw., but its peristome, operculum, collum of the capsule, and areolation of the basal angles of the leaf, are quite different.

PLATE 11, *B*.—HYPNUM OPÆODON: plant, of the natural size. Fig. 1. Portion of a branch. 2, 3, 4, 5, 6, 7, 8. Leaves. 9, 10, 11. Capsules. 12. Operculum. 13. Calyptra. 14. Portion of the double peristome. 15. Tooth of outer peristome. 16, 17. Point and base of leaf, showing the reticulation. 18. Perichætium. 19, 20. Perichætial leaves.—Details magnified.

15. HYPNUM CIRCINALE, *Hook.*

*Hypnum circinale*, Hook. Musc. Exot. t. 107; Müll. Synop. Musc. Frond. 2, p. 318.

HAB. Fort Nisqually, Port Discovery, and Spipen River, Oregon.

16. HYPNUM GRACILISSETUM, *Hsch. et Rienw.*

*Hypnum gracilisetum*, Hsch. & Rienw. Nov. Act. Acad. Cæs. Leop. 14, 2, Suppl. p. 727; Schwægr. Suppl. 3, 1, t. 220.

*Hypnum mundulum*, Sulliv. in Proceed. Amer. Acad. Art. Sci. (Jan. 1854.)

HAB. Southeast coast of the District of Puna; also base of Mauna Kea, Hawaii, Sandwich Islands.

17. HYPNUM MOLLICULUM, *Sulliv.* (Tab. 11.)

*H. monoicum, pusillum, flaccidum*; caule prostrato vage diviso, ramis ascendentibus laxè foliosis; foliis oblongo-lanceolatis attenuatis obsolete bicostatis lineari-areolatis, cellulis alaribus majoribus; capsulâ cernua gibboso-oblonga; pedicello debili flexuoso.

*Hypnum molliculum*, Sulliv. in Proceed. Amer. Acad. Art. Sci. (Jan. 1854.)

HAB. Forests at the Eastern base of Mauna Kea, Hawaii, Sandwich Islands.

A small, delicate, flaccid species, with yellowish-green shining foliage, and a loose mode of growth. Stem prostrate, branches weak,

ascending. Leaves loosely and bifariously imbricated, spreading, from a broad subtruncate concave base, oblong-lanceolate, gradually tapering into a sharp point; costa very short or nearly obsolete; margins erect and entire; areolation rather lax, composed of cellules long and flexuous except at the basal angles, where they are shorter, wider, and more pellucid. Capsules cernuous, short, hypnoid, with a weak flexuous and smooth pedicel 4-5 lines high. Teeth of the peristome linear-lanceolate: cilia carinate from a broad membrane, of the same length as the teeth: ciliolæ single. Perichætical leaves few, loosely imbricated, erect, the upper ones with long attenuated points. Antheridia 4-5, without paraphyses.

Closely related to *H. gracilisetum*, H. et R., but is a smaller and more flaccid species, constantly monoicous, has leaves with entire margins, and perichætical leaves gradually acuminate. The ramification is also different.

PLATE 11, A.—*HYPNUM MOLLICULUM*: plant, of the natural size. Fig. 1. Portion of stem, with leaves and radicles. 2, 3, 4, 5, 6. Leaves. 7, 8, 9. Portions of same, showing the reticulation. 10, 11. Capsules. 12. Operculum. 13. Portion of the double peristome. 14. Perichæcium. 15. Perichætical leaf. 16. Male bud. 17. Antheridia, paraphyses, and perigonial leaf.—Details magnified.

# 18. *HYPNUM TENUISETUM*, *Sulliv.* (Tab. 13.)

*H. monoicum*; caule prostrato tenui flexili extenso parce diviso, divisionibus dissite breviter pinnatis; foliis laxis subbifariis ovato-lanceolatis serrulatis leniter papillosis subecostatis lineari-areolatis, cellulis marginalibus distinctioribus, alaribus amplis inflatis; capsula exigua hypnoidea, pedicellis numerosis longis gracilibus.

*Hypnum tenuisetum*, Sulliv. in Proceed. Amer. Acad. Art. Sci. (Jan. 1854.)

HAB. Tutuila, Samoan, or Navigator's Islands.

Stems prostrate, creeping, 4-5 inches long, at the ends flagelliform, two or three times divided, pinnate, branchlets short and distant.

Leaves spreading, loose, subbifarious, ovate-lanceolate, concave, serrate, with two short indistinct costæ at base: areolation linear; the cellules minute, slightly papillose, the marginal ones larger, conspicuous, three or four at each of the basal angles, large, oblong, inflated. Capsule minute, oblong, gibbous, horizontal: peristome (injured) evidently hypnoid: pedicels numerous, long, slender. Perichætical leaves filiformly attenuated, flexuose, serrate, papillose on the back. Male flowers on the main stem, paraphysated. Operculum and calyptra not seen.

PLATE 13, A.—HYPNUM TENUSETUM: plant, of the natural size. Fig. 1. A branch. 2, 3, 4. Leaves. 5, 6. Portions of leaves, showing the reticulation. 7, 8, 9. Capsules. 10. Portion of the double peristome. 11. Perichætium. 12. Perichætial leaf. 13. Male bud. 14. The same, in the axil of a leaf. 15. Antheridium and paraphysis.—Details magnified.

†† *Capsula pendula subæqualis.*

#### 19. HYPNUM ARCUATUM, *Sulliv.* (Tab. 12.)

*H. monoicum, plumulosum, delicatulum; caule prostrato rectangulate diviso, divisionibus dense pinnatis; foliis lanceolatis acuminatis serrulatis ecostatis plus minus falcato-secundis lineari-areolatis; capsulis oblongis subæqualibus pendulis, operculo hemisphærico-conico, pedicellis longissimis apice valde arcuatis.*

*Hypnum arcuatum*, *Sulliv.* in *Proceed. Amer. Acad. Art. Sci.* (Jan. 1854.)

HAB. District of Puna, Hawaii, and East Maui, Sandwich Islands.

A delicate, feathery species, of a golden-yellow. Stems prostrate, with a few short rectangular densely pinnate branches: the branchlets subcompressed. Leaves lanceolate, acuminate, serrulate, ecostate, bifariously imbricated, subfalcato-secund, not crowded; areolation minute, linear. Capsule suboval, nearly symmetrical, pendulous; peristome hypnoid, ciliolæ short, single. Operculum hemispherico-conic;

pedicel smooth, long, slender, its upper part forming a large gradual arch. Male flowers gemmiform, situated on the stem and its main divisions. Antheridia 8–10, paraphysated.

PLATE 12, A.—HYPNUM ARCUATUM: plant, of the natural size. Fig. 1. A plant. 2. Portion of the stem, with leaves. 3, 4, 5, 6. Leaves. 7, 8. Portions of a leaf, showing the reticulation. 9. Cellules of the same. 10. Perichæcium. 11. Vaginula. 12. Perichæcial leaf. 13, 14, 15, 16. Capsules. 17. Same, in a dry state. 18. Portion of the double peristome. 19. Vertical section of the same. 20. Male bud. 21. Antheridium and paraphysis. 22. Perigonial leaf.—Analyses enlarged.

20. HYPNUM SODALE, *Sulliv.* (Tab. 12.)

*H. dioicum, pusillum, deplanato-cæspitans; caule fasciculatim diviso, divisionibus dense pinnatis; foliis lanceolato-attenuatis falcatis secundis vix serrulatis, costellis binis brevissimis, areolatione lineari; capsula ovali pendula, operculo depresso-conico recte rostellato, pedicello longiusculo tenui.*

*Hypnum sodale*, Sulliv. in Proceed. Amer. Acad. Art. Sci. (Jan. 1854.)

*Hypnum molluscoides*, Sulliv. l. c.

HAB. Tahiti and Eimeo, Society Islands.

A small moss, of a soft, pliable texture, forming extended spongy mats; foliage light-yellow. Stems procumbent, about two inches long; fasciculately branched, closely and regularly pinnated as in *Hypnum molluscum*. Leaves from a broad ovate base, gradually tapering into long, falcate, second points, scarcely serrulate, with two short indistinct costæ at base; areolation minute linear. Perichæcial leaves linear-oblong, convolute, with attenuated spreading points. Capsule minute, oval, pendulous, mouth large: teeth of the peristome lanceolate-subulate, articulations close; cilia carinate, imperforate, from a broad plicate membrane; ciliolæ single, occasionally in pairs, unusually large, granular, sometimes rimose: annulus persistent. Operculum hemispherico-conic, with a short straight rostrum. Dioecious.

Resembles very much, small forms of *Hypnum molluscum*, but has differently-shaped capsules, and leaves less distinctly serrated.

PLATE 12, B.—*HYPNUM SODALE*: plant, of the natural size. Fig. 1. Part of a branch. 2, 3, 4. Leaves. 5. A leaf, showing the reticulation. 6. Cellules. 7, 8, 9. Capsules. 10. Portion of the double peristome. 11. Portion of the annulus. 12. Perichætium. 13, 14. Perichætial leaves.—Details magnified.

## 21. *HYPNUM TUTUILUM*, *Sulliv.* (Tab. 10.)

*H. monoicum*; caule prostrato extenso diviso densissime pinnato; foliis e basi constricta ovato-lanceolatis decurvo falcatis subrugulosis brevissime bicostatis, cellulis linearibus; capsula ovali plagiostoma annulata, operculo convexo conico, pedicello flexuoso erecto.

*Hypnum Tutuilum*, Sulliv. in Proceed. Amer. Acad. Art. Sci. (Jan. 1854.)

HAB. Tutuila, Samoan or Navigator's Islands.

Stems 4–5 inches long, slender, prostrate, with two or three main divisions densely pinnate. Leaves from a constricted base, ovate-lanceolate, decurved-falcate, serrulate, subrugulose, slightly bicostate at base, areolation linear. Capsule suboval, pendulous, mouth slightly oblique: teeth of the peristome lanceolate-subulate; the ciliolæ in threes, equal in length to the cilia: operculum hemispherico-conic; pedicel smooth, long, erect, flexuous. Perichætial leaves with attenuated reflexed serrate points. Monoicous: male flowers situated on the main divisions of the stem, paraphysated.

PLATE 10, A.—*HYPNUM TUTUILUM*: plant, of the natural size. Fig. 1. Portion of stem and leaves. 2, 3, 4, 5, 6. Stem-leaves. 7. Perichætial leaf. 8, 9, 10. Portions of leaf, showing the reticulation. 11, 12, 13. Capsules. 14. Portion of the double peristome. 15. Vertical section of the same. 16. Male bud. 17. Perigonal leaf. 18. Antheridium and paraphysis.—Analyses enlarged.



††† *Capsula erecta aequalis.*

22. HYPNUM MICROCARPUM, *C. Müll.*

*Hypnum microcarpum*, C. Müll. Synop. Musc. Frond. 2, p. 326, quoad. plant. Michx.  
*Leskea adnata*, Michx. Flo. Americ. Bor. 2, p. 314.

HAB. Forest at the Eastern base of Mauna Kea, Hawaii, Sandwich Islands.

*Sec. 3. Albescens*: *pusilla; caulis flaccidus repens vage ramosus; folia tenerrima undique vergentia ecostata.*

23. HYPNUM ALBESCENS, *Schwægr.*

*Hypnum albescens*, Schwægr. Suppl. 3, 1, t. 226; Müll. Synop. Musc. Frond. 2, p. 279.

HAB. Philippine Islands.

*Sec. 4. Prælonga*: *Caulis prostratus vage vel pinnatim ramosus rigidiusculus folia e basi cordata ovato-acuminata continuo-costata.*

24. HYPNUM PRÆLONGUM, *Linn.*

*Hypnum prælongum*, Linn. Sp. Pl. p. 1591; Bryol. Brit. p. 348.  
*Eurhynchium prælongum*, Bryol. Europ. 5 Eurhyn. Monogr. p. 8, t. 6.

HAB. Forest at the Eastern base of Mauna Kea, Hawaii, Sandwich Islands.

25. HYPNUM OREGANUM, *Sulliv.* (Tab. 13.)

*Hypnum Oreganum*, Sulliv. in Mem. Amer. Acad. Art. Sci. p. 172. (1849.)

*Hypnum Stokesii*, Müll. Synop. Musc. Frond. 2, p. 448, as to the Columbia River specimens.

HAB. Puget Sound, Oregon.

There is a very close affinity between this moss and *Hypnum Stokesii*, Turn. Rigid examination, with a fuller suite of specimens of the latter species than are now at hand, may prove the Oregon moss to be only a remarkable variety of the same. Compared with the description and figure of *H. Stokesii*, Turn., in the admirable *Bryologia Europæa*, our moss is larger and more robust: the stems are prostrate, creeping, 6–12 or more inches in length, once or twice divided, regularly and closely pinnated, very similar in aspect to those of *Hyp. Crista-Castrensis* (not with short divisions, simple below and pinnated above, the pinnæ decreasing rapidly in length towards the ends of the divisions): the leaves are of a thinner and firmer texture; the areolæ longer and narrower: the basal angles not so convex interiorly: and the perichæatial leaves are reflexed (not simply patent).

In this moss, as in *H. Stokesii*, are found, on the sides of the stems, clusters of minute leaves (paraphyllia (?) *Bryol. Europ.*) surrounding the germinating point of a branchlet.

PLATE 13, B.—HYPNUM OREGANUM: male and female plants, of the natural size. Fig. 1. Portion of a branch. 2, 3, 4, 5. Leaves. 6, 7, 8. Portions of a leaf, showing the reticulation. 9. Cross sections of leaf. 10, 11, 12. Bud-leaves, or paraphyllia. 13, 14, 15. Capsules. 16. Portion of the double peristome. 17. Portion of the pedicel. 18. Perichætium. 19, 20, 21. Perichæatial leaves. 22. Male bud in the axil of a leaf. 23. Male bud detached. 24. Perigonial leaves. 25. Antheridium and a paraphysis.—Details magnified.

26. HYPNUM IMPLEXUM, *Kunze.*

*Hypnum implexum*, Kunze. in schedulis e Müll. Synop. Musc. Frond. 2, p. 445.

*Rigodium implexum* (Kunze., Schwægr.), in Linn. 18, p. 559, t. 9.

HAB. Vicinity of Valparaiso, Chili.

*Sec. 5. Squarrosa: caulis ascendens robustus; folia reflexo-squarrosa ecostata.*

27. HYPNUM ACICULARE, *Brid.*

*Hypnum aciculare*, Brid. Bryol. Univ. 2, p. 105; Schwægr. Suppl. 1, 2, p. 280, t. 92.

HAB. Lord Auckland's Islands. Orange Harbor, Fuegia. Tahiti, Society Islands. Bay of Islands, New Zealand.

The peculiar habit of this moss, its large coriaceous and somewhat inflated calyptra, and the broad medial line of the teeth of the peristome, indicate, as suggested by the authors of the Flora of New Zealand, its being a new genus, for which they propose the name of *Ptychomnion*.

28. HYPNUM LOREUM, *Linn.*

*Hypnum loreum*, Linn. Sp. Pl. p. 1593.

*Hylocomium loreum*, Bryol. Europ. 5, Hylo. Monogr. p. 7, t. 4.

HAB. Oregon.

*Sec. 6. Complanata: caulis decumbens parce divisus turgidiusculæ compresso-foliosus; folia polita obsolete bicostata.*

29. HYPNUM UNDULATUM, *Linn.*

*Hypnum undulatum*, Linn. Sp. Pl. p. 1589.

*Plagiothecium undulatum*, Bryol. Europ. 5, Plagioth. Monogr. p. 17, t. 13.

HAB. Fort Nisqually, Oregon.

30. HYPNUM DENTICULATUM, *Dillen.*

*Hypnum denticulatum*, Dillen. Hist. Musc. p. 266, Tab. 34, f. 5.

*Plagiothecium denticulatum*, Bryol. Europ. 5, Plagioth. Monogr. p. 12, t. 8.

HAB. Orange Harbor, Fuegia.

The specimens, as far as they go—being without flowers or fruit—accord entirely with this species. *Hypnum denticulatum*, Fl. Antarct. p. 111, from Hermite Island, has leaves filiformly acuminate, of a delicate membranous texture, composed of pellucid slender cellules, whose length is to their diameter about as 20 to 1: on it is founded *Plagiothecium Antarcticum*, Bryol. Europ.

31. HYPNUM DRAYTONI, *Sulliv.* (Tab. 14.)

*H. dioicum majusculum laxè cœspitans; caulibus prostratis elongatis tumide compressiusculis parce divisis; foliis laxius imbricatis oblongis ovato-oblongisve valde concavis obtusis, acumine brevi flexuoso terminatis subecostatis, cellulis angustissimis; capsula horizontali gibboso-ovata, pedicello longissimo, operculo conico brevius rostrato.*

*Hypnum Draytoni*, Sulliv. in Proceed. Amer. Acad. Art. Sci. (Jan. 1854.)

HAB. District of Puna, also Forest at Eastern base of Mauna Kea, Hawaii, Sandwich Islands.

Grows in thin, loose, and extensive mats, of a light yellowish-green, shining. Stems rather large, prostrate, 3–6 inches long, subcompressed, turgid, with very few divisions or branches, often simple. Leaves loosely and subbifurcately imbricated, oblong or ovate-oblong, very concave, obtuse, with an abrupt, short, slender, flexuous point, pellucid; costa short; bifurcate; margin entire, not revolute; texture thin and firm; cellules minute, linear, flexuous, condensed, those at the base much shorter and broader. Capsule gibbous, short-ovate, horizontal: pedicel 1½–2 inches high, stiff, smooth: annulus conspicuous,

double: operculum elongate-conic, subrostrate: calyptra cuculliform: teeth of the peristome lanceolate-subulate, closely articulated; cilia carinate, imperforate, from a very broad membrane; ciliolæ in threes. Perichæatial leaves ovate, ovate-lanceolate, and oblong-lanceolate, the inner ones sheathing at base, their upper half spreading, with margins subconvolute and slightly crenate-undulate. Dioicous, male gemmæ axillary, each containing numerous antheridia and paraphyses.

PLATE 14, A.—HYPNUM DRAYTONI: plant, of the natural size. Fig. 1. Portion of the stem, with leaves. 2, 3, 4, 5. Leaves. 6, 7, 8. Portions of a leaf, showing the reticulation. 9, 10, 11. Capsules. 12. Portion of the double peristome. 13. Portion of the annulus. 14. Operculum. 15. Perichætium. 16, 17. Perichæatial leaves. 18. Male bud. 19. The same, in the axil of a stem-leaf. 20, 21. Perigonial leaves. 22. Antheridium and a paraphysis.—Details enlarged.

### 32. HYPNUM EUDORÆ. *Sulliv.* (Tab. 14.)

*H. dioicum*; *cæspite laxa*; *caule prostrato simplici vel paucirameo*; *foliis subbifariam imbricantibus ovato-oblongis valde concavis obtusis abrupte tenuiter brevi-acuminatis angustissime lineari-areolatis breviter bicostellatis*; *capsula cylindracea, subæquali suberecta clavellato-attenuata longiuscule pedicellata*; *operculo conico brevi-rostrato*.

*Hypnum Eudoræ*, Sulliv. in Proceed. Amer. Acad. Art. Sci. (Jan. 1854.)

HAB. Forest at the Eastern base of Mauna Kea, Hawaii; also Kaala Mountains, Oahu; Sandwich Islands.

Stems somewhat turgid, subcompressed, 2–2½ inches long, scarcely 1 line wide, with but few branches, often simple, forming large, loose, shining patches of a light golden color. Leaves loosely and bifariously imbricated, ovate-oblong, obtuse, very concave, with an abrupt, short, flexuous point, estriate, with two short indistinct costæ at base, margins entire, reticulation of very minute linear flexuous cellules. Perichæatial leaves long, convolute, with attenuated and spreading points.

Capsule long-cylindraceous, nearly symmetrical, sub-erect, tapering gradually into the pedicel; mouth slightly oblique. Peristome pale yellow, with two ciliolæ. Annulus double, large. Operculum conic-rostrate, erect. Calyptra cuculliform. Vaginula conic-oblong, without paraphyses. Dioicous: male gemmæ paraphysated.

The smaller size of the whole plant, and the differently shaped capsule, separate this from the preceding species, which in other respects it closely resembles.

PLATE 14, B.—HYPNUM EUDORÆ: male and female plants, of the natural size. Fig. 1. Portion of a branch, with leaves. 2, 3, 4, 5. Leaves. 6, 7, 8. Portions of a leaf, showing the reticulation. 9, 10. Capsules. 11. Peristome, annulus, and portion of capsule. 12. Portion of double peristome. 13. Operculum. 14. Perichætium. 15. Perichætial leaf. 16. Male bud. 17. Perigonial leaf. 18. Antheridium and paraphysis.—Details enlarged.

### 33. HYPNUM BERTEROANUM, *Mont.*

*Hypnum Berteroanum*, Mont. in Ann. Sci. Nat. 1845, p. 89; Müll. Synop. Musc. Frond. 2, p. 243.

HAB. Vicinity of Valparaiso.

### 34. HYPNUM POLITUM, *Hook. fil. & Wils.*

*Hypnum politum*, Hook. fil. & Wils. in Lond. Jour. Bot. 3, p. 553; Flo. Antarct. p. 3, t. 154, f. 2.

HAB. Orange Harbor, Fuegia.

*Sec. 7. Tamariscina: caulis prostratus elasticus villosus dense bi-tri-pinnatim ramosus; folia late cordato-ovata subcontinuo-costata.*

† *Folia papillosa.*

### 35. HYPNUM CYMBIFOLIUM, *Doz. et Molkb.*

*Hypnum cymbifolium*, Doz. & Molkb. in Ann. Sci. Nat. 1844, p. 306; Müll. Synop. Musc. Frond. 2, p. 485.

HAB. Mountains behind Honolulu, Oahu. Southeast coast of the District of Puna, forest at the eastern base of Mauna Kea; also at an elevation of 8000 feet on Mauna Loa, Hawaii. Kaala Mountains, East Maui, Sandwich Islands. Operculum and peristome, the same as in *Thuidium tamariscinum*, Bryol. Europ.

36. HYPNUM PLUMULOSUM, *Doz. & Molkb.*

*Hypnum plumulosum*, Doz. & Molkb. in Ann. Sci. Nat. 1844, p. 308; Müll. Synop. Musc. Frond. 2, p. 486.

*Hypnum Meyenianum*, Hmp. Ic. Musc. t. 8.

HAB. Ovolau, Feejee Islands.

† † *Folia levia.*

37. HYPNUM SPLENDENS, *Hedw.*

*Hypnum splendens*, Hedw. Spec. Musc. p. 262, t. 67.

*Hylocomium splendens*, Bryol. Europ. 5 Hylo. monogr. p. 5, t. 1.

HAB. Oregon.

*Sec. 8. Cuspidata: caulis prostratus ascendensve vage ramosus; rami (ut folia ecostata) pungentes.*

38. HYPNUM CALDERENSE, *Sulliv.* (Tab. 15.)

*H. robustum: caulibus prostratis, ramis erectis simplicibus ramulosisve cuspidatis dense foliosis, foliis patentissimis vel horizontalibus subellipticis longe acuminatis convolutis pungentibus ecostatis superne denticulatis, cellulis minutis linearibus subparenchymaticis oblique subseriatis, alaribus permultis oblongis inflatis concentrice dispositis (flo. et fruct. non visis).*

*Hypnum Calderense*, Sulliv. in Proceed. Amer. Acad. Art. Sci. (Jan. 1855).

HAB. Caldera, Mindanao, one of the Philippine Islands. Without flowers or fruit.

A large and stiff species; foliage somewhat bristly, shining, yellow. Main stem 4–6 inches long, prostrate, sparingly radiculose; branches numerous, erect, 1–2 inches long, simple, or ramulose, they and the ramuli cuspidate. Leaves crowded, widely spreading, almost horizontal, ecostate, of a subelliptical outline, with a long linear often once or twice twisted acumen (about  $\frac{2}{3}$  the length of the rest of the leaf); margins more or less convolute, denticulate above; texture thin, firm, and smooth, composed of very minute, linear pachydermous cellules, indistinctly arranged in obliquely transverse lines; the cellules below the middle of the leaf, exhibit a subcrenate outline. The large subauriculate basal angles of the leaves are composed of numerous (30–40) large transparent, inflated, oblong cellules of a deep golden yellow, arranged in concentric lines.

PLATE 15, B.—HYPNUM CALDERENSE, a barren plant, of the natural size. Fig. 1. Portion of a branch. 2, 3, 4, 5, 6, 7, 8. Leaves. 9. Portion of the base of a leaf, showing the reticulation. 10, 11. Portions of upper part of a leaf, showing the same.—Details magnified.

Sec. 9. *Papillata*: *caulis decumbens vel assurgens vage vel subpinnatim ramosus, folia tenui-acuminata plus minus papillosa.*

### 39. HYPNUM PAPILLATUM, Harv.

*Hypnum papillatum*, Harv. in Lond. Jour. Bot. 2, p. 18; Hook. Ic. Pl. Rar. t. 23, f. 8; Müll. Synop. Musc. Frond. 2, p. 273.

HAB. Feejee Islands.

### 40. HYPNUM PUNGENS, Hedw.

*Hypnum pungens*, Hedw. Sp. Musc. p. 237, t. 60; Doz. & Molkb. Prod. Flo. Bryol. Surin. p. 35, t. 19.



HAB. Mountains behind Honolulu, Oahu; Mountains of Kauai, Sandwich Islands.

41. *HYPNUM PICKERINGII*, *Sulliv.* (Tab. 15.)

*H. monoicum, pusillum, caespitans; caulibus ascendentibus ramosis, ramis apice subuncinatis; foliis oblongo-lanceolatis filiformi-attenuatis plus minus falcato-secundis ecostatis cellulis tenuissimis parce papillulosis, alaribus magnis inflatis; capsula ovali subpendula, operculo longe aciculari-rostrato, pedicello longiusculo superne grosse tuberculato.*

*Hypnum Pickeringii*, Sulliv. in Proceed. Amer. Acad. Art. Sci. (January, 1854).

HAB. Mountains behind Honolulu, Oahu; District of Puna, Hawaii; Sandwich Islands. Tahiti, Society Islands.

A small plumulose species, forming dark-yellow, compact mats. Stem irregularly branched; the branches ascending and usually sub-falcate at their summits. Leaves crowded, patent-incurved or slightly falcato-secund, oblong-lanceolate, concave, gradually tapering into a long filiform subtubulous serrated point, ecostate; cellules minute, linear, more or less papillulose: at each of the basal angles are 2 or 3 large subquadrate, inflated yellowish cellules. Perichæatial leaves oblong-convolute, suddenly tapering into a long, serrulate point. Pedicel five or six lines long, slender, weak; above, strongly tuberculate; below, smooth. Capsule minute, oval subpendulous; mouth, coral red. Teeth of the peristome light yellow, the medial line broad and transparent; cilia from a broad membrane, perforated on the keel; ciliolæ single. Operculum acicular-rostrate, long as the capsule. Cellules of the cuculliform calyptra, spirally arranged. Monoicous: male gemmæ containing three or four antheridia, paraphysated.

This species, compared with *Hypnum scaberrulum*, Mont. has the upper half only (not the entire length) of the pedicel, tuberculate. Its leaves are much less falcate, and are slightly (not strongly) papillulose.

*Hypnum hamatum*, Doz. & Molkb. has remarkably long, secund, hamato-falcate leaves, with cellules destitute of papillæ, and shorter

than in either of the above species; its pedicel, however, is tuberculate on the upper part only.

Müller (Synop. Musc. frond. 2, p. 272) unites *H. hamatum* with *H. scaberrulum*, but according to authentic specimens from their authors, they are distinct.

PLATE 15, A.—*HYPNUM PICKERINGII*: plant, of the natural size. Fig. 1. Portion of a branch. 2, 3, 4. Leaves. 5, 6, 7, 8. Portions of a leaf, showing the reticulation. 9. Base of a leaf. 10, 11, 12, 13. Capsules. 14. Portion of the double peristome. 15. Side view of a tooth of the peristome. 16. Calyptra. 17. Perichætium. 18, 19. Perichætial leaves. 20. Male bud. 21. Antheridium and perigonal leaf.—Analysis enlarged.

#### 42. *HYPNUM CRINITUM*, Hook. fil. & Wils.

*Hypnum crinitum*, Hook. fil. & Wils. in Lond. Jour. Bot. 3, p. 555; Flo. New Zealand, p. 114, t. 91, f. 4.

HAB. Lord Auckland's Islands.

A variable and widely distributed moss, found in New South Wales, Tasmania, New Zealand, and Auckland's Islands, but rarely in fruit. Small in size, and of a color varying between pale green, rufous, and dull yellow; ramification variable, usually fasciculately branched; the branches mostly short, closely, pinnately, and bipinnately ramulose, sometimes considerably extended, simply and distantly pinnated, as in the figure above cited (where the plant is represented too large): stems somewhat firm, elastic, reddish, conspicuous through the leaves, which are always more or less papillose, varying in this respect in different leaves on the same branch.

*Hypnum acutifolium*, Hook. fil. & Wils. (*Hyp. extenuatum*, Brid.?) with leaves gradually, not abruptly filiformi-acuminate, may be a form of this species. *Hypnum tanytrichum*, Mont., is a nearly related species, but has julaceous branches, and broadly obovate, more membranous leaves, with a closer and more linear areolation.

Sec. 10. *Cochlearifolia*: *caulis prostratus vago parce vel subpinnatim ramosus*; *folia orbiculari-ovata valde concava obsolete bicostata*.

43. HYPNUM COCHLEARIFOLIUM, *Schwægr.*

*Hypnum cochlearifolium*, Schwægr. Suppl. 1, 2, p. 221, t. 88.

*Hypnum flexile*, Hook. Musc. Exot. t. 110.

HAB. Bay of Islands, New Zealand.

44. HYPNUM CHLAMYDOPHYLLUM, *Hook. fil. & Wils.*

*Hypnum chlamydophyllum*, Hook. fil. & Wils. in Lond. Jour. Bot. 3, p. 552; Flo. Antaret. p. 139; *H. arcuatum*, Mont. e Mitten in Hook. Jour. Bot. 1856, p. 264.

HAB. Orange Harbor, Fuegia.

45. HYPNUM APERTUM, *Sulliv.* (Tab. 16.)

*H. monoicum*: caule prostrato elongato remote subpinnatim ramoso; ramis inæqualibus complanatis; foliis laxis bifariis oblique orbiculari-ovatis acuminulatis modice concavis ecostatis concinne elliptico-areolatis; capsula truncato-ovali horizontali pendulave, operculo convexo-conico.

*Hypnum apertum*, Sulliv. in Proceed. Amer. Acad. Art. Sci. Jan. 1854.

VAR.  $\beta$ . *condensatum*: statura minore; caulibus assurgentibus densius pinnato-ramosis; foliis longius tenuiter acuminatis.

HAB. Tahiti, Society Islands; var.  $\beta$ . Sandwich Islands.

A medium-sized pale yellow, shining moss, forming extensive mats. Stems 4–6 inches long, sparingly pinnately branched; branches flat, of unequal lengths. Leaves ovate and orbicular-ovate, concave, more or less oblique, bifariously directed, distant, acuminulate, entire, ecostate, of a firm and thin texture, with a small, neatly defined, elliptical, or fusiform areolation. Capsule subgibbose-oblong, horizontal or pendulous. Peristome hypnoid; ciliolæ, 2. Annulus double. Operculum hemispherico-conic. Calyptra not seen. Pedicel erect, flexuous, smooth, an inch or more long. Perichætil leaves oblong, convolute, with long, flexuous points. Monoicous: male flower minute, situated

on the main stem; perigonial leaves broad, ovate; antheridia 5-7. Paraphyses present in both flowers.

The variety from the Sandwich Islands is smaller, and has a more condensed mode of growth, the stems assurgent, and closely pinnately branched, with more crowded and longer acuminate leaves.

PLATE 16, B.—HYPNUM APERTUM: plant, of the natural size. Fig. 1. Portion of branch, with leaves. 2. Leaf. 3. Part of leaf, showing the reticulation. 4. Cellules of the same. 5, 6. Capsules. 7. Portion of peristome. 8. Perichætium. 9, 10. Perichætial leaves. 11. Male bud. 12. Antheridia. 13. Vaginula.

C.—VAR.  $\beta$ . CONDENSATUM: plant, of the natural size. Fig. 1. Portion of a branch. 2, 3, 4, 5, 6, 7. Leaves. 8. Leaf, showing the reticulation. 9. Capsule. 10. Vaginula. 11. Male bud. 12. Antheridium. 13. Perichætium. 14. Perichætial leaf. 15. Portion of peristome.—Details enlarged.

Sec. 11. *Cinclidotoidea: caulis fluitans pluries divisus, folia lurido-viridia oblongo-lanceolata, costa-continua, marginibus incrassatis.*

#### 46. HYPNUM CONSPISSATUM, Hook. fil. & Wils.

*Hypnum conspissatum*, Hook. fil. & Wils. in Lond. Jour. Bot. 3, p. 553; Flo. Antarct. p. 419, t. 155, f. 3.

HAB. Orange Harbor, Fuegia; barren.

#### 47. HYPNUM LIMBATUM, Sulliv. (Tab. 16).

*H. cinclidotoideum fluitans elongatum ramosissimum laxifolium; foliis oblongo vel lineari-lanceolatis acuminatis rigidis modice carinato-concavis costa dorso versus apicem serrata percursis incrassato-limbatis superne serratis, cellulis oblongis subopacis (fl. et fr. deficientibus).*

*Hypnum limbatum*, Sulliv. in Proceed. Amer. Acad. Art. Sci. (Jan. 1855).

HAB. New Zealand, on stones in the bottom of streams.

A species with the habit and aspect of *Cinclidotus*. Color blackish green. Stems attached at base only by a dense mass of rootlets; 5–7 inches long, divided into numerous long, floating, sparsely ramulose branches. Leaves distant, patent either in a dry or moist state, occasionally with a tendency to twist; oblong, or linear-lanceolate, acuminate, slightly carinate-concave, serrulate above, with a strong continuous costa, which is serrate on the back near the apex; margins with a thickened border resembling the costa; texture firm, dense; cellules rather minute; those above oblong, sub-opaque, with the primordial utricle more or less distinct; those below, linear-oblong, subpellucid.

*Hypnum conspissatum*, which this species very much resembles, is a somewhat larger plant, with leaves more crowded; falcato-secund less oblong, more gradually acuminate, and long-cuspidate by the excurrent costa; the margins are not serrate, nor the costa on the back near the apex: moreover, the reticulation is smaller.

PLATE 16, A.—HYPNUM LIMBATUM: plant, of the natural size. Fig. 1, 2. Portions of stems with leaves. 3, 4, 5, 6, 7. Leaves. 8. Cross section of leaf. 9. Portion of base of leaf, showing the reticulation. 10. Point of leaf, showing the same. 11. Cellules of leaf.—Details enlarged.

Sec. 12. *Uncinata*: *caulis ascendens fastigiato-divisus*; *folia falcato-secunda unicastata*.

#### 48. HYPNUM ADUNCUM, *Hedw.*

*Hypnum aduncum*, Hedw. Stirp. Crypt. 4, p. 62, t. 24; Bryol. Europ. 6, Hyp. Monogr. p. 35, t. 24.

HAB. Orange Harbor, Fuegia. Andes (as high as the snow-line), behind Santiago, Chili. Specimens from both localities barren.

#### 49. HYPNUM FLUITANS, *Linn.*

*Hypnum fluitans*, Linn. Flo. Suec. ed. 2, p. 399; Bryol. Europ. 6, Hyp. Monogr. p. 33, t. 22.

HAB. Snow-line of the Andes, behind Santiago, Chili.

*Sec. 13. Pterygophylloidea : caulis prostratus complanatus subpinnatus ; folia asymmetrice ovato-acuminata obsoletissime bicostata.*

50. HYPNUM MONTAGNEI, Schimp.

*Hypnum Montagnei*, Schimp. in Schedulis; Mont. Hist. Phys. Nat. Cuba, Crypt. p. 489, t. 19, f. 3.

*Pterygophyllum Montagnei*, Belan. Voy. Ind. Orient. Cryptog. p. 85, pl. 9, f. 1.

HAB. Feejee Islands.

*Sec. 14. Plumosa : caulis prostratus vage ramosus ; folia ovato-lanceolata subcontinuo-costata.*

51. HYPNUM PLUMOSUM, Linn.

*Hypnum plumosum*, Linn. Sp. Plant. p. 1592.

*Hypnum pseudo-plumosum*, Brid. Bryol. univ. 2, p. 472.

*Brachythecium plumosum*, Bryol. Europ. 6, Brachyth. monogr. p. 4, t. 3.

HAB. Mountains of Tahiti, Society Islands. Sandwich Islands.

52. HYPNUM WILKESIANUM, Sulliv. (Tab. 17.)

*H. dioicum majusculum rigidum ; caulibus prostratis paucirameis, ramis elongatis erectis attenuatis ; foliis ovato-lanceolatis concavis reguloso-striatis toto ambitu serrulatis dense oblongo-areolatis evanido-costatis ; capsula cylindraceo-oblonga subæquali erecta subulato-operculata longe pedicellata.*

*Hypnum Wilkesianum*, Sulliv. in Proceed. Amer. Acad. Art. Sci. (Jan. 1854).

HAB. Southeast coast of the District of Puna. Forest at the eastern base of Mauna Kea, Hawaii; also Kaala Mountains, Kauai; Sandwich Islands.

A large rigid species forming extended loose mats, of a dingy yellow color. Stems 3–5 inches long, prostrate, with a few ascending, elongated, slightly compressed branches. Leaves ovate-lanceolate, concave, patent-divergent, somewhat incurved, rugulose-striate, at base saccate-plicate; margins narrowly reflexed, serrulate; costa strong, reaching nearly to the point; texture firm, thin, composed of minute oblong cellules. Perichæatial leaves numerous; the exterior subsquarrose; the interior sub-erect, with long, flexuous, filiform, serrate points. Capsule cylindraceous-oblong, erect, sub-symmetrical, gradually tapering into the pedicel; mouth slightly oblique. Annulus simple. Operculum about as long as the capsule, the rostrum erect, from a conic base. Pedicel slender, flexuous, two or more inches long, arising from near the base of the branchlets. Teeth of the peristome closely articulated, linear-subulate; cilia about the length of the teeth, slender, carinate from a broad membranous base; ciliolæ rudimentary. Columella emergent. Sporules large. Archegonia 40–50. Dioicous: male plant smaller than the female. Antheridia 35–40. Paraphyses abundant in both flowers.

PLATE 17, *B.*—HYPNUM WILKESIANUM: male and female plants, of the natural size. Fig. 1. Portion of stem, with leaves. 2, 3, 4, 5. Leaves. 6. Cross-sections of same. 7, 8, 9. Portions of leaves, showing the reticulation. 10. Perichætium. 11. Perichætial leaf. 12. Vaginula and paraphyses. 13. Male bud. 14. Perigonial leaves. 15. Antheridium and paraphysis. 16, 17, 18. Capsules. 19. Portion of double peristome. 20. Calyptra.—Details enlarged.

*Sec. 15. Hispida: caulis elongatus parce divisus hispidulo-foliosus; folia cordato-lanceolata costa valida longe excurrente aristata.*

### 53. HYPNUM HISPIDUM, *Hook. fil. & Wils.*

*Hypnum hispidum*, Hook. f. & Wils. in Lond. Jour. Bot. 3, p. 552; Flo. Antaret. p. 140, t. 61, f. 2.

*Hypnum aristatum*, Sulliv. in Proceed. Amer. Acad. Art. Sci. (Jan. 1854.)

*Trichostomum rigidifolium*, Tayl. in Lond. Jour. Bot. 3, p. 616.

HAB. Bay of Islands, New Zealand.

2. ISO THE CI UM, *Brid.*1. ISOTHECIUM MYOSUROIDES, *Brid.*

*Isothecium myosuroides*, Brid. Bryol. univ. 2, p. 369; Bryol. Europ. 5. Isoth. monogr. p. 7, t. 2.

VAR.  $\beta$ . *Stolonibus deficientibus; pedicellis crassiusculis non tortilibus, operculis breviusculis; foliis ramulinis magis linearibus grossius serratis dorso versus apicem papillois.*

HAB. Coast south of Gray's Harbor, Port Discovery, Puget Sound;  
 $\beta$ . Mt. Rainier; Oregon.

3. PY LA I SE A, *Bryol. Europ.*

*Pylaisea*, Bryol. Europ. 5 Pylais. Monogr. p. 1.

1. PYLAISEA SEMINERVIS, *Kunze.*

*Leskea seminervis*, Kunze; Schwægr. Suppl. 2, 3, t. 273.  
*Hypnum seminerve*, Müll. Synop. Musc. frond. 2, p. 244.

HAB. Chili, vicinity of Valparaiso.

## Tribe 19. NECKEREÆ.

1. NECKERA, *Hedw.*1. NECKERA SCABRIDENS, *C. Mull.*

*Neckera scabridens*, C. Müll. Bot. Zeit. 1847, p. 828; Synop. Musc. 2, p. 51.

HAB. Vicinity of Valparaiso, Chili.



2. NECKERA DENDROIDES, *Hook.*

*Neckera dendroides*, Hook. Musc. Exot. t. 69.

HAB. Kaala Mountains, Oahu; Mauna Kea, Hawaii; Sandwich Islands. Also Feejee Islands.

3. NECKERA DOUGLASII, *Hook.*

*Neckera Douglasii*, Hook. Bot. Miscel. 1830, p. 131, t. 35.

HAB. Port Discovery, Oregon. A few slender, flexuous stems (two inches long), apparently belonging to this species, and furnished with male buds, were found among other mosses from this locality.

4. NECKERA LEPINEANA, *Mont.*

*Neckera Lepineana*, Mont. Ann. Sc. Nat. 1848, p. 107.

HAB. Tahiti, Society Islands. Upolu, Samoan Group; also Feejee Islands.

5. NECKERA PHYLLOGONIODES, *Sulliv.* (Tab. 17.)

*N. pusilla*; caule repente radiculoso squamiformi-folioso; ramis frondiformi-complanatis erectis simplicibus lineari-lanceolatis; foliis patentidivergentibus arcuatis imbricantibus lineari-oblongis e basi ultra medium complicatis dehinc navicularibus, extremo apice leniter recurvo, cellulis minutissimis linearibus, apicalibus rhombeis, basilaribus oblongis amplioribus.

*Neckera phyllogonoides*, Sulliv. in Proceed. Amer. Acad. Art. Sci. (Jan. 1855.)

HAB. Luzon, one of the Philippine Islands.

Main stem slender, creeping, furnished with fascicles of rootlets, and with scale-like, triangular, elongated, acute leaves. The branches erect, simple, 8–12 lines high, and  $1\frac{1}{2}$ –2 lines wide, frondiform, of a linear-lanceolate outline. Leaves bright green, shining, bifariously directed, very closely imbricate, obscurely bicostellate at base, linear complicate below; near and at the oblique apex cymbiform, the extreme point short, acute, and slightly recurved; texture of the leaves firm and thin; the cellules in the middle portion minute, linear; those near the apex wider, rhomboidal; those at the base and its angles, oblong, quadrate, large, and somewhat pellucid.—No flowers or fruit seen.

The plant has very much the appearance of a *Phyllogonium*, but its leaves are not distichously inserted upon the stem.

PLATE 17, A.—NECKERA PHYLLOGONOIDES: plant, of the natural size. Fig. 1. A plant. 2. Portion of stem, with leaves. 3, 4, 5, 6, 7. Leaves. 8, 9, 10. Portions of same, showing the reticulation. 11. Leaf of base of stem. 12, 13. Leaves of the rhizoma.—Details magnified.

## 2. OMALIA, *Brid.*

### 1. OMALIA PULCHELLA, *Hook. fil. & Wils.*

*Omalia pulchella*, Hook. fil. & Wils. Flo. New Zeal. p. 114, t. 91, f. 1.  
*Hookeria punctata*, Hook. fil. & Wils. Lond. Jour. Bot. 1844, p. 550.

HAB. Bay of Islands, New Zealand.

## 3. TRACHYLOMA, *Brid.*

### 1. TRACHYLOMA PLANIFOLIUM, *Hook.*

*Trachyloma planifolium*, Brid. Bryol. Univ. 2, p. 278.  
*Neckera planifolia*, Hook. Muse. Exot. t. 23.

HAB. Bay of Islands, New Zealand.

All the specimens of the collection belong to the male plant, which appears not to have been heretofore described. They are remarkable for having the axis of their branches prolonged, naked, or furnished with distant minute leaflets, and beset at its apex with oblong cylindrical, articulated, brownish bodies (aerial rootlets, Br. & Sch.), like those on the apex of the leaves of *Calymperes* and *Drepanophyllum*. Male buds numerous in the axils of the ordinary leaves; antheridia 12–14 linear-oblong, their pedicel rather long; paraphyses few linear.

Tribe 20. PILOTRICHEÆ.

1. PILOTRICHUM, *Brid.*

1. PILOTRICHUM VITIANUM, *Sulliv.* (Tab. 18.)

*P. majusculum*; caule repente subterraneo tandem ascendente pinnatim (raro sub-bipinnatim) ramoso; ramis robustis interdum apice attenuatis microphyllis; foliis rameis spiraliter quinquefariis confertissimis e basi coarctata oblongis valde cymbiformi-concavis abrupte lineari-acuminatis ecostatis superne subserratis, cellulis minute lineari-fusiformibus, inferioribus subcrenatis (cæt. non lectis).

*Pilotrichum Vitianum*, Sulliv. in Proceed. Amer. Acad. Art. Sci. Jan. 1855.

HAB. Feejee Islands.—Without flowers or fruit.

Plant large and somewhat rigid, with bright yellow foliage. Stem 4–6 inches long, its lower half simple, horizontal, subterranean, leafless; its upper half suddenly erect, and pinnately branched. The plant is multiplied by flagellæ, or stolons from the base of its upright portion, thus having the appearance of a lengthened rhizoma throwing up at intervals leafy divisions. Leaves patent-divergent, very closely imbricating in five distinct, spiral rows, oblong, from a contracted sub-amplexicaul base, strongly cymbiform-concave, suddenly constricted into a linear, acute, subserrulate point, which forms about one-third of the entire length of the leaf; texture thin and firm, cellules very minute, linear, of a uniform size throughout, except at the

base, where they are shorter and broader, and of a deep, red color. The axis of a branch is sometimes prolonged and furnished with a few ramuli, all of which are clothed with minute, lance-linear, acute, appressed leaves.

PLATE 18, A.—PILOTRICHUM VITIANUM: plant, of the natural size. Fig. 1. A branch. 2. Portion of a branch with leaves. 3, 4, 5, 6, 7, 8. Leaves. 9, 10, 11. Portions of leaves, showing the reticulation. 12. Base of leaf, with portion of stem.—Details magnified.

## 2. ENDOTRICHUM, *Doz. & Mollk.*

### 1. ENDOTRICHUM DENSUM, *Dz. & Mb.*

*Endotrichum densum*, Musc. Frond. Ined. p. 3, t. 1.

HAB. Tahiti, Society Islands. Also Feejee Islands.

### 2. ENDOTRICHUM ELEGANS, *Dz. & Mb.*

*Endotrichum elegans*, Dz. & Mb. Musc. Frond. Ined. p. 4, t. 2.

HAB. Upolu, one of the Samoan Islands.

### 3. ENDOTRICHUM SETIGERUM, *Sulliv.* (Tab. 18.)

*E. dioicum robustum molle; caule repente radiciformi, ramis ascendentibus elongato-clavæformibus turgide foliosis; foliis permagnis confertis ellipticis acuminulatis valde plicatis superne serrulatis ecostatis, cellulis exilissimis subseriatis; perichætiis exiguis immersis capsulam ovato-cylindraceam includentibus, perichæcialibus setigeris.*

*Pilotrichum setigerum*, Sulliv. in Proceed. Amer. Acad. Art. Sci. Jan. 1854.  
*Esenbeckia cuspidata*, Mitten. in Lond. Jour. Bot. 1856, p. 263.?

HAB. Feejee Islands.

A large species, with soft, shining, yellow foliage. Probably dioicous. The principal stem creeping, subterranean, leafless; branches fascicled, mostly simple, ascending, 2-3 inches long, thick, tumid, obtuse, subclavate. Leaves crowded, erect-patent, elliptical, acuminate, strongly plicate, serrulate above, ecostate; of a thin and firm texture; cellules of the leaf minute, linear (their length to their diameter as 10 to 1), arranged in somewhat transverse rows, those at the base of the leaf shorter and broader, reddish-orange. Perichætia, for the size of the plant, very small, immersed in the leaves near the top of the branches. Capsule more than half concealed in the perichætil leaves, ovate-cylindrical, with a very short, erect pedicel. The lower perichætil leaves ovate and lanceolate, long-acuminate; the upper ones elongated-oblong, suddenly acuminate, not plicate, strongly and irregularly dentate above; the costa commencing a little below the apex of their lamina, and extending into a long, straight, rigid, dentate seta. Teeth of the peristome linear, acuminate, closely articulated, transversely striolate, with a broad, median line; the basal membrane of the cilia, broad and plicate; rostrum of the operculum straight and long. Calyptra mitriform, scarcely covering the operculum. Archegonia about 24, with paraphyses half their length.

This species has a strong resemblance to *Pilotrichum plicatum*, C. Mull. but its peristome and perichætil leaves are widely different. The capsules in our specimens are either too old or too young for a satisfactory examination.

PLATE 18, B.—*ENDOTRICHUM SETIGERUM*: plant, of the natural size. Fig. 1. A branch, showing the position of the fruit. 2, 3. Leaves. 4. Portion of a leaf, showing the reticulation. 5. Cellules of the same. 6. Base of leaf, with portion of stem. 7. Strap-shaped leaves, or paraphyllia, at the base of the perichætil branch. 8, 9. Cross-sections of a leaf. 10. Young capsule, with operculum and calyptra. 11. Old capsule. 12. Young capsule. 13. Calyptra. 15. Perichætium, with capsule. 16. Peristome, mutilated. 17, 18. Perichætil leaves.—Details magnified.

3. METEORIUM, *Brid.*

The plants ranged under this genus are very imperfectly known: they all agree in having slender, pendulous stems.

1. METEORIUM FLEXICAULE, *Tayl.*

*Leskea flexicaule*, Tayl. Flo. N. Zeal. p. 101.

HAB. Savai, Samoan Group. Mountains of Tahiti, Society Islands. Waya-Rua Bay, New Zealand.

2. METEORIUM BRASILIENSE, *Sulliv.* (Tab. 19.)

*M. dioicum robustum, caule primario repente filiformi aphylo secundario pendulo longissimo ramoso; foliis laxiusculis permagnis e basi cordata orbiculari-ovata amplexante erecta plus minus horizontalibus oblongo-lanceolatis convolutis subito in pilum folio fere duplo longiorem productis subecostatis scariosis minutissime lineari-areolatis; flo. masc. et fruct. non visis.*

*Meteorium Brasiliense*, Sulliv. in Proceed. Amer. Acad. Art. Sci. Jan. 1855.

HAB. Organ Mountains, Brazil; growing on the branches of trees.

A large moss, with a pendulous mode of growth. Foliage glossy; the older bright chestnut, the newer pale yellowish-green. Primary stem leafless, radiciform, tomentose with short rootlets; the secondary stems 2-7 inches in length, rather rigid, flexuous, simple or divided, with a few short branchlets placed mostly at right angles. Leaves nearly three lines in length (including the hair-point), loosely imbricating, spreading horizontally, from a large, cordate, orbicular-ovate amplexicaul, and erect base; the horizontal part oblong-lanceolate, the margins strongly inflexed, suddenly tapering into a somewhat rigid, slightly serrulate hair-point, about as long as the rest of the leaf;

texture membranaceous, firm, composed of very minute, linear, subfusiform, translucent cellules; those at the base of the leaf (for three or four rows deep) shorter, and much broader, opaque, and of a deep, orange-red color. Perichætia small, axillary; the leaves ecostate; the lower ovate awnless, recurved at apex; the upper erect, convolute, oblong, somewhat obtuse, hair-pointed, as in the branch-leaves; the interior shorter, broader, usually awnless, with a pellucid repand margin above; archegonia 23–28, of the usual form, accompanied by linear paraphyses of very unequal lengths, and by filiform processes (abortive leaves), double the length of the archegonia.

PLATE 19, *B.*—METEORIUM BRASILIENSE: plant, of the natural size (inverted by mistake of the engraver). Fig. 1. Portion of a branch. 2, 3, 4, 5, 6. Leaves. 7, 8. Portion of leaf, showing the reticulation. 9. Cellules of leaf. 10. Perichætium. 11, 12. Perichætial leaves.—Analyses enlarged.

### 3. METEORIUM MACRANTHUM, *Doz. & Molkb.*

*Meteorium macranthum*, Doz. & Molkb. Prod. Flo. Bryol. Surinam, p. 47, t. 12.

HAB. Organ Mountains, Brazil.

### 4. METEORIUM MAUIENSE, *Sulliv.* (Tab. 19.)

*M. caulibus longissimis pendulis flexilibus pinnato-ramosis, ramis distantibus simplicibus raro ramulosis interdum filiscenti-attenuatis microphyllis; foliis indistincte 4–5 fariis laxius imbricantibus e basi auriculato-cordata amplexante oblongo-obovatis obtusatis brevi-apiculatis cymbiformi-concavis, marginibus e medio ad apicem late inflexis, cellulis lineari-oblongis, illis utraque ala subquadratis aurantiacis in dis-culum dispositis.*

*Meteorium Mauiense*, Sulliv. in Proceed. Amer. Acad. Art. Sci. Jan. 1855.

HAB. East Maui, Sandwich Islands; on the north bank of the crater Haleakala.

Plant, growing in large, loose masses, older parts of a bright, brownish-yellow, the newer of a pale greenish color. Main stems pendulous, 12–18 inches in length, flexile, pinnately branched. Branches simple, rarely ramulose, 1–3 inches long, somewhat distantly placed at right angles on the stem, flexuous, flaccid, the older ones near the base of the stem occasionally much elongated by a newer and more slender growth, having smaller leaves. Leaves arranged in four or five indistinct spiral rows, loosely imbricating, patent, from an auriculate, cordate base, oblong-obovate, obtuse, apiculate, very concave, the margins of the upper half widely inflexed; texture thin, firm, smooth, and translucent; areolation minute, composed of linear, obtuse-ended, thick-walled, and crenate cellules. In each of the basal angles of the leaves, is a deep, orange-colored, thickened disc, composed of numerous subquadrate cellules.

PLATE 19, A.—METEORIUM MAUIENSE: plant, of the natural size. Fig. 1. A branch. 2, 3, 4, 5. Leaves. 6, 7, 8. Portions of leaf, showing the reticulation.—Details enlarged.

##### 5. METEORIUM NITIDUM, *Sulliv.* (Tab. 20.)

*M. dioicum*; caulibus pendulis longissimis tenuibus distanter ramulosis, ramulis caule crassioribus brevibus cuspidatis sæpe binatim ternatimve fasciculatis; foliis caulinis laxis subappressis lineali-lanceolatis longe attenuatis, rameis patentibus confertis oblongo-ellipticis valde cymbiliformi-concavis subito longissime filiformi-attenuatis mediotenus costatis, cellulis linearibus, alaribus subquadratis griseis; perichætiis laterilibus ramigenis subsessilibus, capsula immersa cylindraceo-oblonga.

*Meteorium nitidum*, Sulliv. in Proceed. Amer. Acad. Art. Sci. Jan. 1855.

HAB. Vicinity of Rio Janeiro, Brazil; on trees.

Dioicous. Plant, pale green, shining, growing in large, loosely-entangled masses. The basal portion (apparently horizontal) of the stem, closely pinnate by simple julaceous branches 6–10 lines long; the remaining portion pendulous, 7–12 inches in length, slender, flexuous, sparingly divided; the divisions having, at long intervals, short, straight, cuspidate branches, often in fascicles of twos and threes,



placed at right angles to, and thicker than the stem. Leaves of the branches erect-patent, closely imbricating, from a narrow base, oblong-elliptical, cymbiform-concave, produced suddenly into a long, flexuous, subdentate hair-point, nearly as long as the rest of the leaf; texture membranaceous, smooth, and firm; areolation minute; cellules linear, parenchymatous; those composing the alar discs numerous, larger, looser, subquadrate, and of a light grayish color; costa slender, translucent, ceasing abruptly in the middle of the leaf. The leaves of the stem and its main divisions are thinner, more distant, subappressed, elongated, and gradually tapering into a more slender and flexuous point. Perichætia rare, sessile, lateral on the older branches; arche-gonia 10–12; paraphyses long, filiform, about 20-septate, and occasionally reticulated at their base. Capsule immersed, oblong-elliptical; pedicel very short; teeth of the peristome long, linear-subulate, orange red, with perforations along the axis; cilia (injured) much shorter, subulate, carinate, arising from a narrow membrane.

PLATE 20, *B*.—METEORIUM NITIDUM: plant, of the natural size. Fig. 1. Portions of one of the main divisions of the stem, and of one of the branches, showing the position of the fruit. 2, 3, 4, 5. Leaves of the stem. 6, 7. Branch leaves. 8. Portion of the base of a branch leaf, showing the reticulation. 9. Upper portion of branch leaf, showing the same. 10, 11. Cellules of the leaf. 12. Perichætium, inclosing capsule. 13, 14, 15. Perichætial leaves. 16. Capsule and a paraphysis. 17. Portion of peristome.—Details magnified.

#### 6. METEORIUM PATULUM, *Doz. & Molkb.*

*Meteorium patulum*, Doz. & Molkb. Prod. Flo. Bryol. Surinam, p. 21, t. 10.

*Hypnum patulum*, Swartz. Prod. Flo. Ind. Occid. p. 140; Hedw. Sp. Musc. p. 279, t. 73.

HAB. Rio Janeiro, Brazil.

#### 7. METEORIUM CRINITUM, *Sp. Nov.* (Tab. 20.)

*M. nitido simillimum, distat tamen ramis efasciculatis; foliis laxius imbricatis magis elongatis multo longius filiformi-attenuatis densius reticulatis, cellulis alaribus intense aurantiaco-rubris nec griseis.*

HAB. Organ Mountains, Brazil.

There is only a small, sterile fragment of this species in the collection. It appears, however, to furnish characters sufficient to distinguish it from any other described species.

PLATE 20, A.—METEORIUM CRINITUM: plant, of the natural size. Fig. 1. A branch. 2, 3, 4, 5. Leaves. 6. Portion of the base of a leaf, showing the reticulation. 7. Point of a leaf, showing the same. —Details enlarged.

8. METEORIUM HELICTOPHYLLUM, *Mont.*

*Meteorium helictophyllum*, Mont. in Voy. Pole. Sud. Crypt. p. 322.

HAB. Savai, one of the Navigator's Islands. Tahiti, Society Islands.

9. METEORIUM FLORABUNDUM, *Doz. & Molkb.*

*Leskea florabunda*, Doz. & Molkb. Ann. Sci. Nat. 1844, 2, p. 310.

*Hypnum florabundum*, C. Müll. Synop. Musc. 2, p. 265.

HAB. Samoan, or Navigator's Islands.

10. METEORIUM VITIANUM, *Sp. Nov.* (Tab. 21.)

*M. majusculum*; caulibus longissimis pendulis divisis rectangulate ramosis ramis distantibus simplicibus vel pauci-ramulosis; foliis horizontalibus laxis bifariis e basi lata cordata-ovata lanceolatis filiformi-attenuatis toto ambitu serratis semi-costatis plicato- et ruguloso-implanis, cellulis minutissimis lineari-fusiformibus unipapillosis (flo. et fruct. non lectis).

HAB. Feejee Islands: upon trees.

A large species growing in loose and extensive masses. Stems flexuous, pendulous, 6–8 inches long, variously divided; branches distant, 1–3 inches long, simple or sparingly ramulose. Leaves horizontal, loose, bifarious, from a broad cordate-ovate base, lanceolate, filiformly attenuated, serrate from the base to the apex; costa reaching half way; texture thin and firm, composed of minute, linear-fusi-form cellules, each having a single papilla in the middle.

Resembles *Meteorium longissimum*, Doz. & Molkb. (Musc. Frond. Ined. p. 159, t. 48), but the leaves of that species are undulate on the margins, have a shorter acumination, and are not papillose.

PLATE 21, A.—METEORIUM VITIANUM: plant, of the natural size. (Inverted by an error of engraver.) Fig. 1. Portion of a branch. 2, 3, 4. Leaves. 5. Portion of base of leaf, showing the reticulation. 6. Point of leaf, showing the same. 7. Cellules of the leaf. 8. Perichæcium. 9, 10. Perichæcial leaves. 11. Archegonia and paraphyses. —Details enlarged.

#### 11. METEORIUM MOLLE, Hedw.

*Meteorium molle*, Hedw.; Hook. fil. & Wils. in Flo. N. Zeal. p. 100.  
*Leskea mollis*, Hedw. Musc. Frond. 4, t. 40.

HAB. Bay of Islands. New Zealand.

#### 12. METEORIUM TRICHOPHORUM, Mont.

*Isothecium trichophorum*, Mont. Ann. Sci. Nat. 1843, p. 236.  
*Neckera trichophora*, C. Müll. Synop. Musc. 2, p. 130.

HAB. Forest at the base of Mauna Kea, Hawaii, Sandwich Islands.

#### 13. METEORIUM CIRRHIFOLIUM, Schwægr.

*Meteorium cirrhifolium*, Schwægr. Suppl. t. 218; Horusch. Flo. Brazil, p. 90.

HAB. Organ Mountains, Brazil.

Tribe 21. **HOOKERIÆ.**1. **HOLOBLEPHARUM**, *Doz. & Molkb.*1. **HOLOBLEPHARUM TAITENSIS**, *Sulliv.* (Tab. 23.)

*H. dioicum*, caule repente pinnato; foliis laxè bifariis ellipticis acuminate cymbiformi-concavis breviter bicostellatis sub apice undulato-constrictis lineari-areolatis papillulosis, marginibus reflexis serratis, perichætalibus plicatis ciliato-dentatis superne dorso papillosis; capsula erectiuscula cylindræco-oblonga subinæquali, operculo longe aciculari-rostrato, pedicello breviusculo superne tuberculoso, calyptra elongato-conico-mitriformi pilosa basi fimbriata, fimbriis loriformibus denticulatis.

*Hookeria Taitensis*, Sulliv. in Proceed. Amer. Acad. Art. Sci. Jan. 1854.

**HAB.** Mountains of Tahiti, Society Islands.

Stem mostly simple, 3 to 4 inches long, creeping, closely adhering by rootlets along its entire length, simply pinnate; branches 4 to 6 lines long, crowded, obtuse. Leaves loosely and bifariously placed, spreading, elliptical, short-acuminate, concave, slightly striate, undulate-constricted below the point, serrulate, shortly bicostate, subpellucid, yellowish-green, shining; areolation of minute linear papillulose cellules, those at the point broader and shorter. Perichætal leaves erect, oblong, lanceolate, plicate, ciliate-dentate, very strongly papillose on the back. Vaginula oblong, without paraphyses; attached to its upper end are a few strap-shaped processes like the fimbriæ on the base of the calyptra. Capsula oblong-cylindrical, with an oblique mouth, gradually tapering into an erect pedicel, which is muriculate on its upper half only, and springs from the lower part of the branches. Teeth of the exterior peristome linear-lanceolate, attenuated, very closely articulated, with a narrow median line, prominently lamellose on the interior face; cilia of the inner

peristome linear, carinate, imperforate, arising from a narrow membrane; ciliolæ rudimentary. Columella large, conspicuous. Annulus none. Operculum long as the capsule, subulate rostrate, from a sub-conic base. Calyptra elongated-mitræform, densely hispid, with erect, simple, or jointed hairs, and furnished at base, which is more or less cloven, with long, flexuose, reticulated, and dentate fimbriæ.

Near *Chætomitrium elongatum*, Doz. & Molkb., which appears to be a more robust species, with terete branches, leaves closely imbricating, perichæatial leaves simply serrulate and smooth on the back, and the fimbriæ of the calyptra not denticulate.

*Hookeria Philippiensis*, Mont. (Lond. Jour. Bot. v. 4, p. 10), another closely related species, has also terete branches, but with perichæatial leaves laciniated at apex.

PLATE 25, B.—*HOLOBLEPHARUM TAITENSIS*: plant, of the natural size. Fig. 1. Portion of a branch. 2, 3, 4. Leaves. 5. Portion of base of leaf, showing the reticulation. 6. Upper part of leaf, showing the same. 7, 8. Capsules. 9. Portion of the peristome. 10. Vertical section of same. 11. Portion of pedicel. 12. Perichætium and calyptra. 13. Perichæatial leaf. 14. Vaginula and fimbriæ of calyptra. 15, 16. Fimbriæ of base of calyptra.—Analyses enlarged.

## 2. *HOLOBLEPHARUM SPECIOSUM*, *Sp. Nov.* (Tab. 22.)

*H. dioicum*, caule repente pinnatim ramoso, ramis complanatis confertis; foliis bifariis oblongis acuminatis sub apice undulato-constrictis serrulatis concavis substriatis brevissime bicostatis margine reflexis, cellulis linearibus parce papillulosis, perichæatialibus apice plus minus dissectis serrulatis; capsula oblongo-elliptica asymmetrica erecto-cernua, pedicello longiusculo superne tuberculoso, operculo peristomio et calyptra *Holo. rugifolii*.

HAB. Samcan or Navigator's Islands.

Larger than the last or the next species. Stem 3 to 5 inches long, prostrate, furnished with fascicles of rootlets throughout its length,

pinnately branched. The branches very flat, 4 to 5 lines long, and  $1\frac{1}{2}$  to 2 lines broad, obtuse, crowded, usually simple. Leaves bright green, shining, rather loose, bifarious, the lateral patent-divergent, the anterior and posterior appressed, all oblong acuminate, with their points slightly recurved, and more or less undulate; serrulate, concave, substriate, narrowly reflexed in the margins, furnished at the base with two very short parallel costæ; areolation rather loose, of linear pellucid cellules, which are here and there minutely papillose. Perichæatial leaves numerous, connivent, all strongly serrate, not papillose on the back; the upper ones with their points entire, or cut into two or three segments. Capsule oblong or elliptical, hypnoid, erecto-cernuous, gradually tapering into a moderately long pedicel tuberculate on its upper half only, and arising from the branches a little below their base. Peristome, operculum, and calyptra, as in *Holo. rugifolium*.

The regular pinnate ramification, the shorter, broader, and more complanate branches, and the frequently dissected points of the perichæatial leaves, readily separate this from the next species. *Hookeria Philippiensis* has dissected perichæatial leaves also; but the branches are terete.

PLATE 22, B.—HOLOBLEPHARUM SPECIOSUM: plant, of the natural size. Fig. 1. Portion of a branch. 2, 3, 4. Stem-leaves. 5, 6, 7. Portions of same, showing the reticulation. 8. Calyptra. 9. Hairs, from base of calyptra. 10. Capsule, with operculum and portion of pedicel. 11. Portion of peristome. 12. Vaginula. 13. Perichætium. 14, 15. Perichæatial leaves. 16. Portion of upper half of pedicel.—Details magnified.

### 3. HOLOBLEPHARUM RUGIFOLIUM, *Sp. Nov.* (Tab. 22.)

*H. dioicum*, caule prostrato diviso vage vel subpinnatim ramoso, caule ramisque subcomplanatis, foliis sub-bifuriis lanceolatis acuminatis serratis papillulosis margine vix reflexis brevissime bicostatis apice valde rugoso undulatis, areolatione lineari laxiuscula; capsula subovali cernua, operculo longe rostrato, pedicello toto hispidissimo, calyptra

*elongato-conica hirta basi pilis simplicibus multi-septatis fimbriata; perichætialibus pectinato-dentatis dorso apicem versus ciliato-papillosis.*

HAB. Feejee Islands; on trees.

The newer parts pale green, the older brownish-yellow. Stems 2 to 4 inches long, 1 to 1½ lines wide, prostrate, creeping, with two or three main divisions, each division irregularly or subpinnately branched. Leaves crowded, bifariously imbricated, lanceolate, acuminate, concave, serrate, indistinctly bicostate at base, with apex very much rugose-undulate; cellules not compact, linear-oblong, slightly and minutely papillose, capsule suboval, horizontal, exannulate. Operculum as long as the capsule, with a hemispherico-conic base, and a subulate decurved rostrum. Pedicel erect, very hispid its entire length. Calyptra elongate-conic, covered with short, straight, and geniculate hairs; the base fringed with long, flexuous hairs, composed of elongated cellules, placed end to end. Peristome same as in *Holo. Taitensis*, except that the teeth are not so closely trabeculate. Perichætial leaves pectinate-dentate on the margins and ciliate-papillose on the back above. Vaginula very short.

The long and much undulated points of the leaves and the pedicel ciliate-hispid its entire length, are the principal distinguishing marks of this species.

*Holoblepharum leptopoma* and *H. orthorrhynchum*, are smaller mosses than those just described; the first has a close bipinnate ramification, and ovate, horizontally spreading leaves, with plain apices; the second is remarkable for its minute, pendulous, obovate capsules.

PLATE 22, A.—*HOLOBLEPHARUM RUGIFOLIUM*: plant, of the natural size. Fig. 1. Portion of stem, with leaves. 2, 3. Stem-leaves. 4. Portion of base of stem-leaf, showing the reticulation. 5. Upper part of leaf, showing the same. 6. Calyptra, with portion of pedicel. 7. Hair from base of Calyptra. 8, 9. Capsules. 10. Portions of outer and inner peristome. 11. Vertical section of the same. 12. Portion of pedicel. 13. Vaginula. 14. Perichætium. 15. Perichætial leaf. 16. Portion of margin of perichætial leaf.—Details magnified.

2. ERIOPUS, *Brid.*1. ERIOPUS CRISTATUS, *Brid.*

*Chaetophora (Eriopus) cristatus*, Brid. Bryol. Univ. 2, p. 339.

*Leskea cristata*, Hedw. Sp. M. p. 211, t. 49.

*Hookeria cristata*, Hook. & Grev. Edinb. Jour. Sci. No. 14, p. 229, Pl. 4; C. Mull.  
Synop. Musc. Frond. 2, p. 205.

HAB. Waiaruru Bay; New Zealand.

3. SCHIZOMITRIUM, *Br. & Sch.*

*Schizomitrium*, Bryol. Europ. sub *Hookeria*, p. 3.

1. SCHIZOMITRIUM PAPILLATUM, *Mont.*

*Hookeria papillata*, Mont. Ann. Sci. Nat. 1845, 4, p. 93; *H. oblongifolia*, Sulliv. in  
Proceed. Amer. Acad. Art. Sci. Jan. 1854.

HAB. Samoan or Navigator's Group of Islands; also Feejee Islands.

4. HOOKERIA, *Smith.*1. HOOKERIA NIGELLA, *Hook. fil. & Wils.*

*Hookeria nigella*, Hook. fil. & Wils. Flo. New Zeal. p. 124, t. 93, f. 6.

HAB. Lord Auckland Islands.

2. HOOKERIA DEBILIS, *Sulliv. (Tab. 21.)*

*H. dioicum*; caule prostrato vage diviso; foliis lanceolatis longe acuminatis ecostatis flaccidis dissitis bifariis, areolatione laxissima, cellulis



*fusiformibus; capsula clavato-obovata arcuata horizontali, operculo permagno cupulato longissime rostrato (calyptra deficiente).*

*Hookeria debilis*, Sulliv. in Proceed. Amer. Acad. Art. Sci. Jan. 1854.

HAB. Feejee Islands; also Samoan Islands: growing on a fern.

A small, pale-green moss, of a delicate, flaccid texture, and of a plumulose aspect. Stems prostrate, creeping, 1–2 inches long, with a few irregular branches. Leaves lanceolate, filiformly attenuated, rather distant, bifarious, flexuose, of a very loose reticulation; the areolæ fusiform, pellucid, the intersecting lines broad, pale green. Capsule elongated, arcuate, horizontal, gradually tapering from the wide mouth into the pedicel. Operculum long as the capsule, with a large, hemispherical base, and a subulate, decurved rostrum. Teeth of the peristome linear-acuminate, densely articulated, the two series of the outer stratum widely separated to near the point; the cells of the inner stratum forming strong, projecting lamellæ; the processes of the inner peristome carinate, arising from a plicate membrane. Pedicel smooth, erect from the main stem. Perichætial leaves numerous, the inner ones long, convolute, with an abrupt, filiform point. Calyptra not seen.

The specimens are few and imperfect, furnishing only one capsule, and that perhaps not in a normal state.

PLATE 21, *B*.—*HOOKERIA DEBILIS*: plant, of the natural size. Fig. 1. Portion of a branch. 2, 3, 4. Leaves. 5. Leaf, showing the reticulation. 6. Perichætium and calyptra. 7, 8. Perichætial leaves and antheridium. 9. Antheridia on the vaginula. 10. Portion of the peristome. 11. Capsule.—Details enlarged.

## 5. *MNIADELPHUS*, *C. Müll.*

*Mniadelphus*, C. Müll. Bot. Zeit. 1847, p. 938; Synop. Musc. Frond. 2, p. 20.

1. MNIADELPHUS CUSPIDATUS, *C. Müll.*

*Mniadelphus cuspidatus*, C. Müll. Synop. Musc. Frond. 2, p. 26.

*Distichophyllum cuspidatum*, Doz. & Molkb. Musc. Archip. Ind. p. 101, t. 33.

HAB. Tahiti, Society Islands.

2. MNIADELPHUS DICKSONI, *Hook. & Grev.*

*Hookeria Dicksoni*, Hook. & Grev. in Brewster's Edinb. Jour. Sci. 2, p. 226, t. 5 (1825); Hook. fil. & Wils. in Lond. Jour. Bot. (1844), p. 550, and in Flo. Antart. p. 115, 1845.

*Mniadelphus Dicksoni*, Hampe in Müll. Synop. Musc. Frond. 2, p. 25 (1851).

HAB. Orange Harbor, Fuegia: found among Hepaticæ.

Closely allied to the New Zealand *Hookeria adnata*, Hook. fil. & Wils. (Fl. N. Zeal.) which is distinguished by its regularly fringed calyptra, the narrower border and smaller reticulation of its leaf, the smaller capsule, and the narrower median line of the teeth of its peristome.

The base of the calyptra of *M. Dicksoni*, is shortly 5-6 laciniate, and fringed by numerous one-celled hairs, which are very fugacious.

3. MNIADELPHUS FREYCINETII, *C. Müll.*

*Mniadelphus Freycinetii*, C. Müll. Synop. Musc. Frond. 2, p. 26.

*Hookeria Freycinetii*, Mont. Voy. Bonit. Bot. 1, p. 296.

*Hypnum Freycinetii*, Schwægr. Suppl. 3, 2, t. 279.

HAB. Mountains behind Honolulu, Oahu, Sandwich Islands: in a barren state.

4. MNIADELPHUS PARADOXUS, *C. Müll.*

*Mniadelphus paradoxus*, C. Müll. Synop. Musc. Frond. 2, p. 24.

*Hookeria (Pterogophyllum) paradoxa*, Mont. Voy. Bonit. Bot. p. 296.

HAB. Hawaii, District of Puna, Sandwich Islands; without fruit.

5. *MNIADELPHUS VITIANUS*, *Sulliv.* (Tab. 24.)

*M. dioicum*; caulibus ascendentibus frondiformibus subsimplicibus; foliis complanate imbricatis e basi oblonga orbiculari-spathulatis toto ambitu pellucide marginatis abrupte cuspidatis (cuspidate torta) mollibus semicostatis, areolatione laxissima, superne rotundato-inferne oblongo-hexagona; capsula minuta ovali longicolla horizontali, operculo subulato-rostrato, calyptra setoso-hirta basi fimbriata, pedicello tuberculato.

*Mniadelphus Vitianus*, Sulliv. in Proceed. Amer. Acad. Art. Sci. Jan. 1854.

HAB. Feejee Islands; on decayed wood.

A glaucous green plant, with ascending stems 1–2 inches high, and 2–2½ lines broad, complanate, fissidentoid in appearance, mostly simple or with one or two branches. Leaves closely imbricate, oblong or sublinear-spathulate, of a flaccid, delicate texture; margins undulate, surrounded by a conspicuous, translucent border (composed of linear flexuous cellules), which runs out at the apex of the leaf into a twisted cusp; areolation large, rotund-hexagonal above, oblong-hexagonal below; costa slight, scarcely half the length of the leaf. Capsules minute, dark brown, short-oval, with a long collum, horizontal, mouth slightly oblique, exannulate. Teeth of the exterior peristome linear, acuminate, closely articulated, the two series of the outer layer of cellules widely separated; the inner peristome a plicate membrane, divided above into carinate cilia. Operculum long as the capsule, subulate-rostrate from a conic base. Pedicels numerous, springing from near the apex of the stem, strongly tuberculate, flexuose, enlarged at the base. Vaginula oblong. Perichætil leaves loose, small, elliptical-ovate, concave. Calyptra mitraiform, hispid, fringed at base with long, simple, flexuous cellules. Dioicous. Male flower axillary, stipitate; antheridia 12–15; paraphyses rudimentary.

Compared with *Distichophyllum spathulatum*, Doz. & Molkb. (Musc. Frond. Ined. p. 103, t. 34 et 35); a very closely related species, *Mniadelphus Vitianus*, differs by its much more distinctly bordered leaves,

their twisted point, and shorter costa; also by the enlarged base of its pedicel, which is tuberculate, not setose-hispid.

PLATE 24.—MNIADELPHUS VITIANUS. Fig. 1, 2. Fertile plants. 3. Male plant; all of the natural size. 4. A fertile plant. 5, 6, 7, 8. Leaves. 9, 10, 11, 12. Cross-sections of leaf. 13. Cross-section of leaf, showing the cellules. 14. Base of leaf. 15. Leaf, showing the reticulation. 16. Portion of leaf, showing the same. 17. Calyptra, capsule, pedicel, and perichætical leaves. 18, 19. Capsules. 20. Peristome. 21. Portion of peristome. 22. Vertical section of same. 23. Calyptra. 24. Male bud, in the axil of a leaf. 25. Male bud, detached. 26. Antheridium.—All the figures magnified, except Nos. 1, 2, and 3.

Tribe 22. PHYLLOGONIEÆ.

1. PHYLLOGONIUM, *Brid.*

1. PHYLLOGONIUM FULGENS, *Hedw.*

*Phyllogonium fulgens*, Brid. Bryol. Univ. 2, p. 671.

*Pterigynandrum fulgens*, Hedw. Musc. Frond. 4, t. 39.

HAB. Vicinity of Rio Janeiro, Brazil. Also Savai, one of the Navigator's Islands.

2. PHYLLOGONIUM ELEGANS, *Hook. fil. & Wils.*

*Phyllogonium elegans*, Hook. fil. & Wils. Flo. N. Zeal. p. 102, t. 88, f. 6.

HAB. Bay of Islands, New Zealand.

## Tribe 23. CRYPHÆEÆ.

1. CRYPHÆA, *Mohr*.1. CRYPHÆA CUSPIDATA, *Sulliv.* (Tab. 23.)

*C. monoica, parvula*; caule primario repente defoliato, secundario adscendente arcuato subpinnatim ramoso; foliis ovato-acuminatis ovato-lanceolatisve continuo-costatis, perichætalibus interioribus oblongis costa longe excurrente cuspidatis; capsula immersa oblongo-ovata speciose annulata, operculo conico-rostrato, calyptra dimidiato-mitriiformi apice papillulosa.

*Cryphæa cuspidata*, Sulliv. in Proceed. Amer. Acad. Art. Sci. Jan. 1854.

HAB. Vicinity of Valparaiso, Chili; on trees.

Monoicous. A small species, with dull yellow, lustreless foliage. The principal stem procumbent, leafless, ascending, or pendant; fasciculately pinnate, with short branches. Leaves erect-patent, when dry closely pressed to the stem, broad ovate-acuminate, concave, carinate-costate, the margins entire, recurved near the base; cellules minute, subrotund. The costa large, percurrent. Perichætia numerous, terminal on short branchlets, arranged in one or two lines along the stem. Interior perichætial leaves elliptical-oblong, cuspidate by the rigid excurrent costa. Capsule immersed, oblong-ovate, with a very short pedicel, and a large compound annulus. Operculum obliquely rostrate from a conic base. Calyptra dimidiate-mitriiform, papillulose above. Teeth of the peristome linear-lanceolate, closely trabeculate below, nodose and granular above; median line distinct; cilia as long as the teeth, much narrower, carinate below. Male gemmæ axillary, shortly pedicelled; antheridia 5-7, with long pedicels; paraphyses few and short; perigonial leaves broad ovate, with short, recurved, obtuse points, ecostate, submargined.

The long-cuspidate interior perichætial leaves furnish the most decided character for distinguishing this species.

PLATE 23, A.—*CRYPHLÆA CUSPIDATA*: plant, of the natural size. Fig. 1. Portion of a plant, with two capsules. 2. Portion of the stem, with a capsule and male bud. 3, 4, 5, 6. Leaves. 7. Cross-section of leaf. 8. Points of leaf, showing the reticulation. 9. Cellules of leaf. 10, 11, 12. Capsules. 13. Capsule, dry. 14. Portion of peristome and annulus. 15. Calyptra. 16. Apex of calyptra. 17, 18, 19. Perichætial leaves. 20. Male bud. 21. Perigonial leaf. 22. Antheridium.—Analyses enlarged.

Tribe 24. *SPIRIDENTEÆ*.

1. *SPIRIDENS*, *Nees*.

1. *SPIRIDENS REINWARDTII*, *Nees*.

*Spiridens Reinwardtii*, *Nees*. in *Nov. Act.* 2, 1, p. 143, t. 17; *Schwægr. Suppl. t.* 147; *Hook. Bot. Miscel.* 1, t. 1.

HAB. Upolu and Savai, Navigator's Islands. Ovolau, Feejee Islands. Tahiti, Society Islands.

The male plant (heretofore undescribed) occurs in the Ovolau collection. It is about the size of the fertile plant, and more compound in its ramification. The branches and branchlets are attenuated into long pendulous flagellæ, clothed with minute appressed leaves; giving to the whole plant a light, feathery aspect. Male buds few, stipitate, situated in the axils of the stem-leaves; perigonial leaves 10–12; the lower ovate, ecostate, muticous; the upper oblong, slightly margined, erose-dentate above, suddenly produced into long, spreading points in which the heavy excurrent costa is predominant; antheridia 18–20, large, elongated, pedicelled; paraphyses numerous, linear, acute, 20-septate, longer than the antheridia.

## Tribe 25. LEUCODONTÆÆ.

## 1. PTEROGONIUM, Swartz.

## 1. PTEROGONIUM GRACILE, Swartz.

*Pterogonium gracile*, Swartz. Disp. Syst. Musc. Frond. Suec. p. 26; Bryol. Europ. 5  
Pterog. Monogr. p. 4, t. 1.

HAB. California.

## 2. ALSIA, Sulliv.

*Calyptra cuculliformis glabra. Operculum conico-rostratum. Peristomium duplex; exterius dentes sedecem lineali-lanceolati; interius cilia totidem dentibus alternantia filiformia e membrana angusta carinata, orta; ciliolis subnullis. Capsula cylindrica, recta vel subincurva, exannulata, brevi-pedicellata, perichætio elongato emersa. Florescentia dioica; flores masc. numerosi. Caulis arcte repens, defoliatus; rami plus minus resupinati ramulis microphyllis parce breviter subpinnati. Folia ovato-oblongove-lanceolata, lævia, punctiformi-areolata. Habitatio arborea. Habitus perichætiium foliorumque areolatio Lasicæ; peristomium calyptraque Leskeæ.*

*Alsia*, Sulliv. in Proceed. Amer. Acad. Art. Sci. (Jan. 1855.)

## 1. ALSIA CALIFORNICA, Hook. &amp; Arn. (Tab. 25.)

*Neckera Californica*, Hook. & Arn. Bot. Beech. Voy. p. 162; Müll. Synop. Musc. Frond. 2, p. 117.

HAB. California; on trees.

Grows in elastic masses, of a dark-green color. The primary stem leafless, adhering by fascicles of short rootlets to the bark of trees, giving off at right angles numerous secondary stems 2–3 inches long,

and 1-2 lines wide, more or less resupinate and compressed, subpinately branched; the branches short, slender, not crowded. The leaves rather loosely imbricating, erect-patent, ovate or oblong-lanceolate, moderately concave, substriate uneven; margins narrowly reflexed, slightly serrulate at the point; costa reaching nearly half way; areolation of minute subrhombic cellules. Investing the secondary stems at the base of the leaves are minute, variously shaped paraphyllia. Leaves of the branches smaller and narrower. Perichætia long and slender, situated on the upper part of the secondary stems. Capsule oblong-cylindrical, straight or slightly curved, exanulate. Pedicel short, mostly concealed by the long, filiformly acuminate perichætil leaves. Calyptra smooth, dimidiate, narrow, extending below the middle of the capsule. Operculum conic, with a long slender rostrum. Teeth of the outer peristome linear lanceolate, attenuate, distantly articulated, with a distinct median line, below yellowish striolate, above grayish-white, scabrous; cilia of the inner peristome nearly as long as the teeth, subulate, nodosely articulated, punctulate, arising from a narrow plicate membrane; ciliolæ none, or rudimentary. Dioicous: male plants intermixed with, and about the size of the fertile; branches longer and more spreading. Perigonia numerous, large, and conspicuous, placed closely together in two lines, one on each side of the stem. Antheridia 4-6, paraphysated.

This species has strikingly the aspect of *Lasia trichomitron*, but its smooth calyptra, double peristome, and dioicous inflorescence, show it to be not only specifically, but generically distinct.

PLATE 25.—*ALSIA CALIFORNICA*: male and female plants, of the natural size. Fig. 1. Portion of a stem, with mature fruit. 2, 3, 4. Stem-leaves. 5, 6. Lower and upper parts of leaf, showing the reticulation. 7. Cellules of the same. 8. Cross-sections of a leaf. 9, 10. Branch-leaves. 11. Capsule and perichætium. 12. Capsule. with operculum. 13. Deoperculated capsule. 14. Peristome, with portion of capsule. 15. Portion of outer and inner peristome, with spores. 16. Vertical section of peristome. 17. Calyptra. 18. Perichætial branch, vaginula, archegonia, paraphyses, and portion of pedicel. 19, 20. Perichætial leaves. 21. Male bud. 22. Male bud in the axil of a leaf. 23. Male flower. 24. Antheridium and para-



physis. 25. Perigonal leaves. 26. Paraphyllia.—Details magnified.

### 3. ANTITRICHIA, *Brid.*

#### 1. ANTITRICHIA CURTIPENDULA, *Brid.*

*Antitrichia curtispindula*, *Brid.* Mantiss. Musc. p. 136; Bryol. Europ. 5 Antitr.

Monogr. p. 2, t. 1.

*Neckera curtispindula*, auct.

HAB. Island of Madeira; also Oregon.

### 4. CYRTOPUS, *Brid.*

#### 1. CYRTOPUS SETOSUS, *Hook.*

*Cyrtopus setosus*, *Brid.* Bryol. Univ. 2, p. 235.

*Neckera setosa*, *Hook.* Musc. Exot. t. 8.

HAB. Dusky Bay, New Zealand.

### 5. LEUCODON, *Schwægr.*

#### 1. LEUCODON LAGURUS, *Hook.*

*Leucodon Lagurus*, *Hook.* Musc. Exot. t. 126.

HAB. Orange Harbor, Fuegia.

This species may, for the present, be considered quasi-monoicous; no male buds, developed in the normal way, have yet been observed. Minute slender stems, abounding in male buds and rootlets, are found on the leaves of the fertile plant. Perigonal leaves 6–8; antheridia 3–7; paraphyses rudimentary.

*L. Lagurus* has a distinct, simple, adherent annulus, and an ochreate vaginula.

Mr. Wilson, in *Bryologia Britannica*, very properly suggests a new genus (*Lampurus*) for this and *Leucodon tomentosus*, Hook.

Tribe 26. HYPOPTERYGIEÆ.

1. HYPOPTERYGIUM, *Brid.*

1. HYPOPTERYGIUM ROTULATUM, *Hedw.*?

*Leskea rotulata*, Hedw. Sp. Musc. p. 213, t. 51.?

*Hypopterygium rotulatum*, Hook. fil. & Wils. in Flo. N. Zeal. p. 118.

HAB. Tahiti, Society Islands.

Our specimens accord entirely with the description of *H. rotulatum*, in the Flora of New Zealand above cited, and are no doubt the same; but, as there remarked, it is doubtful whether *Leskea rotulata*, Hedw., was intended for this species, or for the next, *H. Novæ Seelandiæ*. And, indeed, it may be further remarked, there is a doubt whether Hedwig's species was intended for either.

2. HYPOPTERYGIUM NOVÆ SEELANDIÆ, *C. Müll.*

*Hypopterygium Novæ Seelandiæ*, C. Müll. Bot. Zeit. p. 562 (1851).

*H. Smithianum*, Hook. fil. & Wils. in Flo. N. Zeal. p. 118.

*H. rotulatum*, C. Müll. Synop. Musc. Frond. 2, p. 9.?

HAB. New Zealand; also Tahiti, Society Islands.

3. HYPOPTERYGIUM GLAUCUM, *Sulliv.*

*H. dioicum*; *H. Novæ Seelandiæ* simillimum sed differt statura multo minore, colore glaucescente, foliis (in sicco vel humido) subjulaceo-imbri-

*catis fragilibus minus asymmetricis rotundato-ovalibus brevius acuminatis, ramis maxime incurvo-deflexis, stipulæformibus pro foliorum ratione majoribus: fr. non viso.*

*Hypopterygium glaucum*, Sulliv. in Proceed. Amer. Acad. Art. Sci. Jan. 1855.

*H. Smithianum*, var. *minus*, Hook. fil. & Wils. Flo. N. Zeal. p. 118.

HAB. New Zealand.

The glaucous color, diminutive size (smallest of the genus), rotund-oval, nearly symmetrical ordinary leaves, and proportionately large stipuliform leaves, appear to indicate a species sufficiently distinct from *H. Novæ Seelandiæ*.

#### 4. HYPOPTERYGIUM TAMARISCINUM, Hedw.

*Leskea tamariscina*, Hedw. Sp. Musc. p. 212, t. 51, f. 1, 7.

*Hypnum setigerum*, Beauv. Prod. p. 70.

*Hypopterygium commutatum*, C. Müll. Synop. Musc. 2, p. 9.

*H. setigerum*, Hook. fil. & Wils. Flo. N. Zeal. p. 118.

HAB. New Zealand.

It appears almost impossible to ascertain what species was intended by *Hypnum tamarisci*, Swartz (Flo. Ind. Occ.), founded on specimens from Jamaica. Specimens with this name, from Swartz himself, in the Hookerian Herbarium, are said (Musc. Exot. t. 35) to be identical with *L. rotulata*, Hedw., likewise an obscure species; in the Flora Antartica, p. 117, they are said to be the same as a Fuegian species, now *H. didictyon*, C. Müll.; and in Flora of New Zealand, p. 118, they are referred to *H. laricinum*, Hook. Musc. Exot. t. 35, which itself is doubtless founded on two different species, one from the Cape of Good Hope, the other from the Andes of South America—the name *laricinum*, Hook., being very properly adopted by Taylor and by Müller, for the Cape moss only. Furthermore, Taylor's description (Lond. Jour. Bot. 6, p. 338) of "authentic fertile specimens of *Hypnum tamarisci*, Swartz," agrees accurately with our moss. Hence, the Swartzian species being, to say the least, very obscure; if,

indeed, it should not be abandoned entirely, it would seem proper not to supersede Hedwig's name *tamariscinum*, for a moss first so described and figured by him, as to place its identification beyond doubt. The specific name *tamarisci*, notwithstanding its close resemblance to *tamariscinum*, might still be retained for Swartz's Jamaica *Hypopterygium*, if it can be identified from his description.

##### 5. HYPOPTERYGIUM DIDICTYON, C. Müll.

*Hypopterygium didictyon*, C. Müll. Synop. Musc. Frond. 2, p. 9.

*Hypnum laricinum*, Hook. Musc. Exot. t. 35, ex Hook. fil. & Wils. in Flo. Antarct. p. 117.

HAB. Orange Harbor, Fuegia.

Readily known by its dioicity, its subrotulate ramification, its pale, greenish-yellow foliage, and its distinctly margined leaves, the basal and central cellules of which are larger than those towards the margin and apex.

##### 6. HYPOPTERYGIUM BRASILIENSE, Sulliv. (Tab. 26.)

*H. monoicum* ; caulibus erectis inferne simplicibus, superne in frondem erectam pinnato-divisis ; foliis distichis asymmetrice cordato-ovatis oblique acuminulatis anguste pellucido-marginatis semi-costatis apice serrulatis, cellulis æqualibus rhombeis subopacis, stipulæformibus rotundatis cuspidatis marginatis continuo-costatis ; capsula ovali horizontali collo longiusculo, operculo cupulato longe rostrato, peristomio hypnoideo binatim ciliolatis ; pedicellis sparsis longiusculis crassiusculis ; perichaetialibus ecostatis.

*Hypopterygium Brasiliense*, Sulliv. in Proceed. Amer. Acad. Art. Sci. Jan. 1855.

HAB. Organ Mountains, Brazil.

Stems erect, 1-1½ inches high, below simple blackish, furnished with scattered appressed scarious leaves, above pinnately branched into an erect, frond-like top, of a more or less ovate outline ; branches mostly simple, the lower ones moderately ramulose. Leaves bright green, distichous, slightly imbricating, obliquely cordate-ovate, with

an oblique, upwardly directed acuminulation, strongly serrate at apex, with a narrow, pellucid margin, costa simple, cellules minute, rhomboid, subopaque, their primordial utricles conspicuous. The stipuliform leaves one-fourth the size of the main leaves, and thrice the width of the stem, rotund-ovate, cuspidate, slightly serrate, narrowly margined, their costa distinct and continuous. Capsule horizontal, oval, tapering gradually into a distinct collum. Operculum conico-cupulate, with a decurved rostrum, nearly as long as the capsule. Peristome hypnoid, large, pale yellow; ciliolæ in pairs. Calyptra minute, narrowly conic, split on one side, scarcely covering the rostrum. Pedicels 4–7 lines long, erect, not aggregated, red, rather thick, easily separating from the vaginula, the upper portion of which is not hidden by the loose, lanceolate, long-acuminate, subecostate, perichæatial leaves. Monoicous: antheridia 7–9, large, linear, long-pedicelled; paraphyses small, scarcely longer than the pedicel of the antheridia, composed of 6–9 cellules, the upper one about three times as long as all the rest together.

*H. incrassato-limbatum*, and *H. nivale* (Mull. Synop. 2, p. 8, 9), are nearly allied to our species; the first, however, is dioicous, and has a thickened and broader margin to the leaf; the second has the costa of its stem-leaves constantly bifurcate, and its stipuliform leaves semi-costate, but gives, like *H. Brasiliense*, to water in which it is immersed, a yellow color.

*H. scutellatum*, Tayl., another closely related species, has shorter and thicker pedicels, and semi-costate stipuliform leaves, and does not color water yellow.

The "*spiculæ breves fragiles*," noticed in Lond. Jour. Bot. 6, p. 338, as being on the sides of the stems of *H. scutellatum*, are compact, cuspidate, undeveloped branch-buds, composed of three or four minute, linear-lanceolate leaflets; they occur on *H. Brasiliense*, and other South American species, and are altogether different from the setulæ of *H. tamariscinum*, Hedw.

PLATE 26, B.—HYPOPTERYGIUM BRASILIENSE: plants, of the natural size. Fig. 1. Portion of stem, with main and stipuliform leaves, male

flowers, and perichæcium. 2. Portion of stem, with the ordinary and stipuliform leaves. 3, 4. Principal leaves. 5. Upper portion of the same, showing the reticulation. 6. Cellules of same. 7. Capsule, operculum, and calyptra. 8, 9. Capsules, with opercula. 10. Capsule, without operculum. 11. Calyptra. 12. Tooth of the outer, and a cilium with two ciliolæ of the inner peristome. 13. Portion of upper part of tooth of peristome. 14. Portion of annulus. 15. Perichæcium. 16, 17. Perichæcial leaves. 18. A stipuliform leaf. 19. Male bud. 20. Perigonial leaf, antheridium, and paraphyses.—Details magnified.

### 7. HYPOPTERYGIUM PALLENS, *Hook. fil. & Wils.*

*Lopidium pallens*, Hook. fil. & Wils. in Flo. N. Zeal. p. 119.

*Leskea concinna*, Schwægr. non Hook. ex Hook. fil. & Wils. l. c.

*Hypnum Strutheopteris*, Brid. Sp. Musc. 2, p. 87.?

HAB. Bay of Islands, New Zealand.

The collection contains specimens, gathered in several of the Pacific Islands, too imperfect to characterize, but obviously indicating two or three undescribed species of *Hypopterygium*.\*

\* The species now known of *Hypopterygium*, may be briefly characterized as follows:—

#### 1. *Caules setulis intrafoliaceis.*

1. H. TAMARISCINUM: ramificatione rotulata, foliis spinuloso-serrulatis, capsula pendula, peristomio duplici.—*Leskea tamariscina*, Hedw. Sp. Musc. p. 213, t. 51. New Zealand!

2. H. CILIATUM: ramificatione subrotulata, foliis fimbriato-ciliatis, capsula erecta, peristomio simplici.—*Pteri. ciliatum*, Hedw. Sp. Musc. p. 84, t. 17. New Zealand!

#### 2. *Caules setulis nullis.*

a. *Peristomium internum ciliolis interpositis.*

† *Inflorescentia monoica.*

3. H. SCUTELLATUM: ramif. pennata erecta, stipuliformibus brevi-costatis.—Tayl. l. in Lond. Jour. Bot. 6, p. 338. Quito.

2. CYATHOPHORUM, *P. Beauv.*1. CYATHOPHORUM PENNATUM, *Labill.*

*Leskea pennata*, Labill. Nov. Holl. Pl. 2, p. 106, t. 253.

*Hookeria pennata*, Hook. Musc. Exot. t. 163.

*Cyathophorum pteridioides*, P. Beauv. Prod. p. 52.

HAB. Bay of Islands, New Zealand.

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4. *H. BRASILIENSE*: ramif. erecta, stipuliformibus continuo-costatis.—Sulliv. vide supra p. 99. Organ Mountains, Brazil!—*H. laricinum*, W. P. Schimp. ! in schedulis. Mexico.
  5. *H. NIVALE*: ramif. pinnata erecta, fol. costa constanter bifurca.—C. Mull. Synop. Musc. 2, p. 9. Venezuela, S. America.
  6. *H. LARICINUM*: ramif. pinnata inclinata, pedicellis flavidis gracilibus.—Hook. Musc. Exot. t. 35, ex parte. Cape of Good Hope!
  7. *H. FLAVESCENS*: ramif. subrotulata, stipuliformibus brevi-costatis.—Hampe in Linnaea, 1847, p. 95. ? Merida, Venezuela.—*H. flaccidum*. Sulliv. MSS. Brazil!
  8. *H. ROTULATUM*: ramif. rotulata, stipuliformibus subecostatis.—Hook. fil. & Wils. in Flo. N. Zeal. p. 118. New Zealand, Tahiti!

†† *b. Inflorescentia dioica.*

9. *H. THOUINI*: ramif. fasciculata, ramis simplicibus vel parce ramulosis, statura majuscula.—Mont. Ann. Sci. Nat. 1845, 2, p. 86. Chili! Straits of Magellan.
10. *H. FILICULÆFORME*: ramif. fasciculata; ramis densissime pinnatis microphyllis, statura majuscula.—Hedw. Sp. Musc. p. 212, t. 50. New Zealand!
11. *H. TAMARISCI*: ramif. pinnata inclinata, foliis laxissime grosse reticulatis.—Swartz. ex Mull. Synop. Musc. Frond. 2, p. 8. Jamaica.
12. *H. INCRASSATO-LIMBATUM*: ramif. pinnata erecta, foliis incrassate pellucide marginatis.—C. Mull. Synop. Musc. 2, p. 8. Brazil.
13. *H. DIDICTYON*: ramif. subrotulata, foliis flaccidis inferne grosse superne minute reticulatis.—C. Mull. Synop. 2, p. 9.—*H. laricinum*, Hook. Musc. Exot. t. 35, ex Hook. fil. & Wils. in Flo. Antaret. p. 117. Fuegia!
14. *H. NOVÆ SEELANDIÆ*: ramif. rotulata, foliis sordide flavidis.—C. Mull. ! in Bot. Zeit. 1851, p. 562.—*H. Smithianum*, Hook. fil. & Wils. in Flo. N. Zeal. p. 118. New Zealand! Tahiti!
15. *H. GLAUCUM*: ramif. rotulata, foliis glaucescentibus, statura perpusilla.—Sulliv. vide supra p. 97. New Zealand!—*H. Smithianum* var. *minus*, Hook. fil. & Wils. in Flo. N. Zeal. p. 118.
16. *H. FLAVO-LIMBATUM*: ramif. pinnata inclinata, foliis subsymmetricis flavido-marginatis.—C. Mull. Synop. p. 10. Nepaul!
17. *H. TENELLUM*: ramif. precedentis, foliis asymmetricis minutius areolatis pellucido marginatis.—C. Mull. in Bot. Zeit. 1854, p. 557. Neelgherries.

## Tribe 27. RACOPILLEÆ.

1. RACOPILUM, *Beauv.*1. RACOPILUM STRUMIFERUM, *C. Müll.*

*Racopilum strumiferum*, C. Müll. in Bot. Zeit. 1851, p. 563.

*Racopilum australe*, Hook. fil. & Wils. Flo. N. Zeal. p. 121, t. 92, f. 7.

HAB. New Zealand.

2. RACOPILUM TOMENTOSUM, *Swartz.*

*Racopilum tomentosum*, Brid. Bryol. Univ. 2, p. 719.

*Hypnum tomentosum*, Swartz. Flo. Ind. Occ. 3, p. 1823; Hedw. Musc. Frond. 4, p. 48, t. 19.

HAB. Organ Mountains, Brazil; Forest sides of Mauna Kea, Hawaii, Sandwich Islands.

## Tribe 28. HELICOPHYLLÆ.

1. HELICOPHYLLUM, *Brid.*1. HELICOPHYLLUM TORQUATUM, *Hook.*

*Helicophyllum torquatum*, Brid. Bryol. Univ. 1, p. 121.

*Anictangium torquatum*, Hook. Musc. Exot. t. 41.

*b. Peristomium internum ciliolis nullis.*

18. H. PALLENS: monoicum, ramif. elongata erecta pinnata vel bipinnata, pedicello asperulo.—Hook. fil. & Wils. in Flo. N. Zeal. p. 119.—*H. Struthiopteris*, Brid.? New Zealand! Tasmania, Chili!

19. H. CONCINNUM: dioicum, ramif. ut in pallente, pedicello lævi.—Hook. Musc. Exot. t. 34. New Zealand. Auckland Islands.



HAB. Vicinity of Rio Janeiro, Brazil.

Tribe 29. RHIZOGONIEÆ.

1. RHIZOGONIUM, *Brid.*

1. RHIZOGONIUM SPINIFORME, *Linn.*

*Hypnum spiniforme*, Linn. Sp. Plant. 1587; Hedw. Musc. Frond. 3, p. 59, t. 25.

HAB. Brazil. Society, Navigator's, and Sandwich Islands.

2. RHIZOGONIUM MNIODES, *Hook.*

*Rhizogonium mnioides*, Schimp. in Bot. Zeit. 1844, p. 125.

*Hypnum mnioides*, Hook. Musc. Exot. t. 77.

HAB. Feejee Islands.

3. RHIZOGONIUM PUNGENS, *Sulliv.* (Tab. 26.)

*R. dioicum?* *cæspite denso hispido; caulibus erectis simplicibus; foliis perlongis patenti-divergentibus rigidis elliptico-lanceolatis duplicato-dentatis concavis costa valida subtereti in aristam dentatam lamina quintuplo longiorem excurrente instructis, cellulis minutis densis subquadratis; perichætiis radicalibus, foliis longissime aristatis: fruct. et flo. masc. non visis.*

*Rhizogonium pungens*, Sulliv. in Proceed. Amer. Acad. Art. Sci. Jan. 1854.

HAB. District of Puna, Southwest coast of Hawaii, Sandwich Islands.

Tufts rough and bristly to the touch, of a bright, reddish-brown color. Stems about three inches high, arising from a dense mat of dark-purple radicles, simple. Leaves patent-divergent, rigid; the lamina elliptical-lanceolate, about one line long, carinate-concave, the margins doubly dentate, or rather bilamellar, each lamella strongly dentate, the costa heavy, subterete, extending 4 or 5 lines beyond the lamina into a stiff awn, dentate on its sides and back; reticulation of minute, dense, subquadrate cellules. Perichætia arising from the dense mat of rootlets at the base of the stem, shortly stipitate; the leaves of a thinner texture, and of a looser reticulation, the exterior, broad-lanceolate, cuspidate, dentate; the interior oblong, entire, furnished with a long excurrent costa, as in the stem-leaves. Archegonia numerous (40-60). Paraphysis linear, 7-10-jointed, somewhat longer than the archegonia.

PLATE 26, A.—RHIZOGONIUM PUNGENS: plant, of the natural size. Fig. 1. Portion of stem, with leaves: 2, 3, 4, 5. Leaves. 6, 7. Portions of leaf, showing the reticulation. 8. Point of leaf. 9. Cross-section of base of leaf. 10. Perichætium. 11, 12, 13, 14, 15, 16. Perichætial leaves. 17. Fertile flower. 18. Archegonium and paraphyses.—Details enlarged.

#### 4. RHIZOGONIUM BIFARIUM, *Hook.*

*Rhizogonium bifarium*, Schimp. Bot. Zeit. 1844, p. 125.

*Hypnum bifarium*, Hook. Musc. Exot. t. 57.

HAB. New Zealand.



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*nigella*, 87.  
*oblongifolia*, 87.  
*papillata*, 87.  
*paradoxa*, 89.  
*pennata*, 102.  
*Philippiensis*, 84.  
*punctata*, 73.  
*Taitensis*, 83.

*Hylocomium loreum*, 58.  
*splendens*, 62.

Hypnæ, 44.

Hypnum *acanthoneuron*, 36.  
*aciculare*, 58.  
*acutifolium*, 65.  
*aduncum*, 68.  
*albescens*, 56.  
*apertum*, 66.  
*arbuscula*, 44.  
*arcuatum*, 53.  
*arcuatum*, 45.  
*aristatum*, 70.  
*Berteroanum*, 61.  
*bifarum*, 105.  
*Calderense*, 62.  
*chlamydophyllum*, 66.  
*chrysogaster*, 48.  
*circinale*, 51.  
*cochlearifolium*, 66.  
*comatum*, 45.  
*comosum*, 45.  
*conspissatum*, 67.  
*crinitum*, 65.  
*Crista-Castrensis*, 57.  
*curvifolium*, 49.  
*cupressiforme*, 48.  
*cymbifolium*, 61.  
*decurrens*, 49.  
*denticulatum*, 59.  
*divaricatum*, 45.  
*Draytoni*, 59.

Hypnum *extenuatum*, 65.  
*Eudoræ*, 60.  
*fasciculatum*, 45.  
*flexile*, 66.  
*florabundum*, 81.  
*fluitans*, 68.  
*Freycinetii*, 89.  
*gracilisetum*, 51.  
*hamatum*, 64.  
*hispidum*, 70.  
*implexum*, 58.  
*imponens*, 50.  
*laricinum*, 98, 99.  
*limbatum*, 67.  
*loreum*, 58.  
*marginatum*, 46.  
*Menziesii*, 44.  
*Meyenianum*, 62.  
*microcarpum*, 56.  
*mnioides*, 114.  
*molliculum*, 51.  
*molluscoides*, 54.  
*molluscum*, 55.  
*Montagnei*, 69.  
*mundulum*, 51.  
*opæodon*, 50.  
*Oreganum*, 57.  
*papillatum*, 63.  
*patale*, 48.  
*patulum*, 80.  
*Pickeringii*, 64.  
*plumosum*, 69.  
*plumulosum*, 62.  
*politum*, 61.  
*prælongum*, 56.  
*pseudoplumosum*, 69.  
*pungens*, 63.  
*Rienwardtii*, 44.  
*scaberrulum*, 64.  
*scabrifolium*, 40.  
*seminerve*, 71.  
*setigerum*, 98.  
*Sieberi*, 45.  
*sodale*, 54.  
*speciosissimum*, 47.  
*spiniforme*, 104.

*Hypnum* spininervium, 45.  
 splendens, 62.  
*Stokesii*, 57.  
*Struthiopteris*, 101.  
*tamarisci*, 98.  
*tanytrichum*, 65.  
 tenuisetum, 52.  
 tomentosum, 103.  
 tricoatum, 46.  
 Tutuilum, 55.  
 undulatum, 58.  
 Wilkesianum, 69.

*Hypopterygiae*, 97.

*Hypopterygium* Brasiliense, 99.  
*ciliatum*, 101.  
*commutatum*, 98.  
*concinnum*, 103.  
 didictyon, 99.  
*filiculæforme*, 102.  
*flavescens*, 102.  
*flavo-limbatum*, 102.  
 glaucum, 97.  
*incrassato-limbatum*, 100.  
*laricinum*, 102.  
 nivale, 100.  
 Novæ-Seelandiæ, 97.  
 pallens, 101.  
 rotulatum, 97.  
*scutellatum*, 100.  
*setigerum*, 98.  
*Smithianum*, 97.  
 tamariscinum, 98.  
*tenellum*, 102.  
*Thouini*, 102.

## I.

*Isothecium* myosuroides, 71.  
*trichophorum*, 82.

## L.

*Lasia trichomitrium*, 95.  
*Leptostomum macrocarpum*, 37.

*Leptostomum Menziesii*, 37.

*Leskea adnata*, 56.  
*concinna*, 101.  
*cristata*, 87.  
*floribunda*, 81.  
*flexicaule*, 77.  
*mollis*, 82.  
*pennata*, 102.  
*rotulata*, 97, 98.  
 seminervis, 71.  
*tamariscina*, 98.

*Leucobryeæ*, 13.

*Leucobryum candidum*, 13.

*Leucodonteæ*, 94.

*Leucodon calycinus*, 12.

*Lagurus*, 96.

*pallidus*, 12.

*rugosus*, 12.

tomentosus, 97.

*Lopidium pallens*, 101.

## M.

*Macromitrium gracile*, 23.

*Nepalense*, 22.

piliferum, 23.

Reinwardtii, 22.

subtile, 23.

Tongense, 22.

*Meesia longiseta*, 36.

*Mielichhoferiæ*, 37.

*Mielichhoferia Andina*, 37.

*Meteorium Brasiliense*, 77.

cirrhifolium, 82.

crinitum, 80.

flexicaule, 77.

floribundum, 81.

helictophyllum, 81.

longissimum, 82.

macranthum, 78.

Mauiense, 78.

molle, 82.

nitidum, 79.

trichophorum, 82.

patulum, 80.

Meteorium Vitianum, 81.  
 Mniadelphus cuspidatus, 89.  
     Dicksoni, 89.  
     Freycinetii, 89.  
     paradoxus, 89.  
     Vitianus, 90.  
 Mnium insigne, 35.  
     Menziesii, 36.  
     punctatum, 35.  
     rhynchophorum, 35.  
     rostratum, 35.  
     venustum, 36.

## N.

Neckereæ, 71.  
 Neckera *Californica*, 94.  
     *curtipendula*, 96.  
     *dendroides*, 72.  
     *Douglassii*, 72.  
     *Lepiniana*, 72.  
     *pallida*, 12.  
     *phyllogonioides*, 72.  
     *planifolia*, 73.  
     *scabridens*, 71.  
     *setosa*, 96.  
     *trichophora*, 82.  
     *tricostata*, 46.

## O.

Octoblepharum albidum, 13.  
     *serratum*, 43.  
 Omalia pulchella, 73.  
 Orthodon serratus, 43.  
     *subglaber*, 43.  
 Orthotricheæ, 20.  
 Orthotrichum crassifolium, 22.  
     *gracile*, 23.  
     *leiocarpum*, 20.  
     *luteolum*, 21.  
     *Lyellii*, 21.  
     *Magellanicum*, 21.  
     *phyllanthum*, 21.  
     *Sturmii*, 21.

## P.

*Peromnion Magellanicum*, 33.  
 Phyllogonieæ, 91.  
 Phyllogonium elegans, 91.  
     *fulgens*, 91.  
 Pilotricheæ, 74.  
 Pilotrichum *plicatum*, 76.  
     *setigerum*, 75.  
     *Vitianum*, 74.  
*Plagiothecium Antarcticum*, 59.  
     *denticulatum*, 59.  
     *undulatum*, 58.  
*Pogonatum alpinum*, 28.  
     *semiangularatum*, 28.  
 Polytricheæ, 27.  
 Polytrichum alpinum, 28.  
     *commune*, 30.  
     *dendroides*, 28.  
     *Junghuhnianum*, 29.  
     *juniperinum*, 30.  
     *oligodus*, 30.  
     *Magellanicum*, 27.  
     *piliferum*, 30.  
     *semiangularatum*, 28.  
     *squamosum*, 28.  
     *tortile*, 29.  
     *undulatum*, 27.  
 Pottieæ, 6.  
 Pottia Heimii, 6.  
*Pterigynandrum fulgens*, 91.  
 Pterogonium gracile, 94.  
*Pterygophyllum Montagnei*, 69.  
 Pylaisea seminervis, 71.

## R.

Racomitrium canescens, 26.  
     *heterostichum*, 26.  
     *lanuginosum*, 26.  
     *protensum*, 26.  
     *rupestre*, 26.  
 Racopileæ, 103.  
 Racopilum *australe*, 103.  
     *tomentosum*, 103.



Racopilum strumiferum, 103.  
 Rhizogoneæ, 104.  
 Rhizogonium bifarium, 105.  
     mnioides, 104.  
     pungens, 104.  
     spiniforme, 104.  
*Rigodium implexum*, 58.

## S.

Schizomitrium papillatum, 87.  
 Schlotheimia nitida, 24.  
*Schlerodontium pallidum*, 12.  
 Sphagnaceæ, 5.  
 Sphagnum cuspidatum, 5.  
     cymbifolium, 5.  
     fimbriatum, 5.  
 Spiridentæ, 93.  
 Spiridens Reinwardtii, 93.  
 Splachneæ, 43.

Streptopogon erythrodontus, 14.  
 Syrrhopodon fasciculatus, 18.  
     Taitensis, 18.  
     tristichus, 19.

## T.

*Thuidium tamariscinum*, 62.  
 Trachyloma planifolium, 73.  
 Trichostomeæ, 13.  
 Trichostomum Andinum, 13.  
     *crispulum*, 14.  
     *exasperatum*, 11.  
     *rigidifolium*, 70.

## Z.

Zygodonteæ, 19.  
 Zygodon Peruvianus, 19.

# **LICHENES.**

BY

**EDWARD TUCKERMAN, A.M.**



# LICHENES.

## FAM. I. COLLEMACEI, *Nyl.*

### 1. LEPTOGIUM, *Fr.*

#### 1. LEPTOGIUM TREMELLOIDES, (*Linn.*) *Fr.*

*Lichen tremelloides*, Linn. Suppl. p. 450.

*Collema tremelloides*, Ach. Lichenogr. p. 655; Syn. p. 325.

*Leptogium tremelloides*, Fr. Pl. Homon. p. 255; Fl. Scan. p. 293; Tuckerm. Lich. Amer. Exs. n. 149; Nyl. Syn. Lich. p. 124.

#### VAR.—AZUREUM, *Eschw.*

*Lichen azureus*, Swartz. Fl. Ind. Occid. 3, p. 1895.

*Collema azureum*, Ach. Lichenogr. p. 654; Swartz. Lich. Amer. p. 21, tab. 15; Ach. Syn. p. 325; Fée, Cryptog. p. 311, tab. 2, f. 17.

*Collema tremelloides azureum*, Eschw. in Mart. Fl. Bras. 1, p. 327.

*Leptogium azureum*, Montag. Crypt. in Sagra. Hist. Cuba, p. 114; Montag. & Vanden Bosch, Lich. Javan. p. 67.

HAB. Pico Ruivo, Madeira. Bay of Islands, New Zealand. Ovolau, Feejee Islands. Oahu, Sandwich Islands.—All the specimens are perhaps referable to the variety. But those from Oahu are elegantly distinguished by their sinuate lobation, the sinuses being large and rounded.

#### 2. LEPTOGIUM MARGINELLUM, (*Sw.*) *Montag.*

*Lichen marginellus*, Swartz. Fl. Ind. Occid. 3, p. 1896.

*Collema marginellum*, Ach. Lichenogr. p. 656; Syn. p. 326.

*Leptogium marginellum*, Montag. Crypt. Cuba, l. c., p. 115, tab. 6, f. 2.  
*Leptogium tremelloides*, var. Nyl. Syn. p. 125.

HAB. Rio Janeiro, Brazil.

## FAM. II. LICHENACEI, *Nyl.*

### 2. SPHÆROPHORUS, *Pers.*

#### 1. SPHÆROPHORUS GLOBIFERUS, (*Linn.*) *DC.*

*Lichen globiferus*, Linn. Mant. p. 133 ; Sm. E. Bot. t. 115.  
*Sphærophorus globiferus*, De Cand. Fl. Fr. 2, p. 327 ; Tuckerm. Lich. Exs. n. 50.  
*Sphærophorus coralloides*, Pers. cit. Ach. Syn. p. 287 ; Fr. Lichenogr. p. 405 ; Montag. in Ann. Sc. Nat. 2, 15, p. 146, tab. 15, f. 1 ; Nyl. Prodr. Lich. Gall. et Alg. p. 34.  
*Sphærophorus coralloides*, var. *laxus*, Turn. & Borr. Lich. Brit. p. 110.

HAB. Summit of Pico Ruivo, Madeira; infertile. St. Jago, Cape de Verds; infertile.

VAR.  $\beta$ . LACUNOSUS: *globiferus*, *lacunosus*; *ramis dilatatis subcompressis lacunosis*. (Tab. 2, f. 5.)

HAB. Orange Harbor, Fuegia; infertile.—A large state, the irregular flattened branches more or less conspicuously lacunose. Color chestnut, with frequent blotches of crimson.

#### 2. SPHÆROPHORUS FRAGILIS, (*Linn.*) *Pers.* (Tab. 2, f. 6.)

*Lichen fragilis*, Linn. Fl. Suec. n. 1121 ; Fl. Lapp. t. 11, f. 4.  
*Sphærophorus fragilis*, Pers. fide Ach. Syn. p. 287 ; Fr. Lichenogr. p. 405 ; Montag. Pl. Cell. in Voy. Pol Sud. p. 171 ; Ejusd. in Hist. Chil. Bot. t. 8, p. 195 ; Tuckerm. Lich. Exs. n. 99 ; Nyl. Prodr. p. 35.  
*Sphærophorus coralloides*, var. *cæspitosus*, Turn. & Borr. Lich. Brit. p. 111.

HAB. Fuegia; infertile.—Possibly distinct from *S. fragilis*; an opinion sustained by my excellent friend Dr. Montagne: but the speci-

mens are too scanty and imperfect, to permit of the separation in this place. With much of the general aspect of ordinary states of the species just spoken of, this has the color of *S. globiferus*. The figure serves to exhibit something of the habit of the Lichen, which deserves farther investigation.

### 3. SPHÆROPHORUS TENER, *Laur.*

*Sphærophoron tenerum*, Laur. in Linnæa, 2, p. 45; Montag. Chil. l. c. p. 194; Hook. f. Bot. Antarct. Voy. 2, p. 530, tab. 197, f. 1; Nyl. Enum. Gen. Lich. in Act. Herb. 5, p. 93.

HAB. Fuegia, infertile.—A dwarfed state, but apparently not otherwise differing from the cited species.

### 3. BÆOMYCES, *Pers.*

#### 1. BÆOMYCES FUNGOIDES, (*Sw.*) *Ach.*

*Lichen fungoides*, Swartz Fl. Ind. Occid. 3, p. 1886.

*Bæomyces fungoides*, Ach. Lichenogr. p. 572; Swartz Lich. Amer. p. 18, t. 13; Ach. Syn. p. 280.

HAB. Bay of Islands, New Zealand.

### 4. CLADONIA, *Hoffm.*

#### 1. CLADONIA VERTICILLARIS, (*Radd.*) *Montag.*

*Cenomyce verticillaris*, Raddi in Att. Soc. Ital. Sci. 13, p. 34, t. 3, f. 4, cit. Eschw.

*Cladonia perfoliata*, Floerk. Clad. p. 30; Eschw. Bras. l. c. p. 268.

*Cladonia spinigera*, Mey. Nebenst. p. 104.

*Cladonia perfoliata*, Hook. herb.

HAB. Rio Janeiro, Brazil.

#### 2. CLADONIA PYXIDATA, (*Linn.*) *Fr.*

*Lichen pyxidatus*, Linn. & Auctt.; Sm. E. Bot. t. 1393.

*Cladonia pyxidata*, Fr. Lichenogr. p. 216; Lich. Suec. n. 235; Tuckerm. Lich. Exs. n. 25; Nyl. Prodr. p. 36.

HAB. Summit of Pico Ruivo, Madeira. Coast south of Gray's Harbor, Oregon. Fuegia. East Maui, Sandwich Islands.

### 3. CLADONIA GRACILIS, (*Linn.*) *Fr.*

*Lichen gracilis*, Linn. & Auctt.; Sm. E. Bot. t. 1284.

*Cladonia gracilis*, Fr. Lichenogr. p. 218.

Var.  $\beta$ . HYBRIDA, Fr. l. c.; Tuckerm. Lich. Exs. n. 27.

HAB. Port Discovery, Puget Sound, Oregon.

Var.  $\gamma$ . ELONGATA, Fr. l. c.; Tuckerm. Lich. Exs. n. 28.

HAB. Summit of Pico Ruivo, Madeira. Fuegia, but the specimens very imperfect. Mauna Loa, Hawaii, Sandwich Islands.

### 4. CLADONIA DEGENERANS, *Floerk.*

*Capitularia degenerans*, Floerk. in Web. & Mohr. Beytr. 2, p. 308, cit. auctore.

*Cladonia degenerans*, Floerk. Clad. p. 41; Fr. Lichenogr. p. 221.

*Cenomyce gonorega*, Ach. Syn. p. 258.

Var.  $\beta$ . CARIOSA, Fr. l. c.; Tuckerm. Lich. Exs. n. 120.

HAB. Bay of Islands, New Zealand.

### 5. CLADONIA FIMBRIATA, (*Linn.*) *Fr.*

*Lichen fimbriatus*, Linn. Suec. n. 1112, e Fr.; Sm. E. Bot. t. 2438.

*Cladonia fimbriata*, Fr. Lichenogr. p. 222.

HAB. Orange Harbor, Fuegia. Hawaii. Bay of Islands, New Zealand.—The typical state will include all the specimens.

6. CLADONIA CORNUTA, (*Linn.*) *Fr.*

*Lichen cornutus*, Linn. & Auctt. pl. e *Fr.* infra cit.

*Cladonia cornuta*, *Fr.* Lichenogr. p. 225 ; *Lich. Suec.* n. 116 ; *Tuckerm. Lich. Exs.* n. 123.

HAB. Summit of Pico Ruivo, Madeira. Fuegia, the var. *excelsa*, *Fr.* l. c.

7. CLADONIA FURCATA, (*Huds.*) *Sommerf.*

*Lichen furcatus*, *Huds.* Fl. Angl. p. 458, cit. *Ach. Syn.* p. 276.

*Cenomyce furcata*, *Sommerf.* Suppl. Fl. Lapp. p. 133.

*Cladonia furcata*, *Fr.* Lichenogr. p. 229.

HAB. Organ Mountains, Brazil. Hawaii. Feejee Islands.—The specimens all referable to var. *racemosa*, Floerk. Coast of Oregon. Summit of Pico Ruivo, Madeira. Both belonging to var. *subulata*, Floerk.

8. CLADONIA SQUAMOSA, *Hoffm.*

*Cladonia squamosa*, *Hoffm.* Germ. p. 125 ; Floerk. Clad. p. 129 ; *Fr.* Lichenogr. p. 231 ; *Lich. Suec.* n. 57 ; *Tuckerm. Lich. Exs.* n. 30.

HAB. Sides and summit of Pico Ruivo, Madeira. St. Jago, Cape Verde Islands. Hawaii, Sandwich Islands.

9. CLADONIA RANGIFERINA, (*Linn.*) *Hoffm.*

*Lichen rangiferinus*, Linn. & Auctt. ; *Sm. E. Bot.* t. 173.

*Cladonia rangiferina*, *Hoffm.* Germ. p. 114 ; Floerk. Clad. p. 160 ; *Fr.* Lichenogr. p. 243 ; *Eschw. Bras. l. c.* p. 273 ; *Montag. Cuba l. c.* p. 202.

HAB. Mauna Loa, Hawaii ; Kaala Mountains, Oahu, Sandwich Islands (var. *sylvatica*, *Ach.*). Orange Harbor, Fuegia. Bay of Islands, New Zealand (var. *alpestris*, *Ach.*). The specimens here referred to the variety *alpestris* differ from the northern Lichen of both



hemispheres, in the radiately denticulate tips of the branchlets; as remarked in Brazilian specimens, by Floerke (Clad. p. 166), and by Eschweiler (Bras. l. c. p. 274).

10. CLADONIA AMAUROCÆA, (*Floerk.*) *Schær.*

*Capitularia amaurocæa*, Floerk. in Web. & Mohr. Beytr. 2, p. 334, cit. auctore.  
*Cladonia amaurocæa*, Schær. Spicil. p. 34; Floerk. Clad. p. 119; Tuckerm. Syn.  
 Lich. N. E. p. 53, & Lich. Exs. n. 130.

HAB. Bay of Islands, New Zealand; a dwarfish infertile state.

11. CLADONIA RETIPORA, (*Labill.*) *Floerk.*

*Bæomyces retiporus*, Labill. Nov. Holl. Pl. Spec. 2, p. 110, t. 254, f. 2.  
*Cenomyce retipora*, Ach. Syn. p. 248.  
*Cladonia retipora*, Floerk. Clad. p. 181.

HAB. Bay of Islands, New Zealand.

12. CLADONIA AGGREGATA, (*Sw.*) *Eschw.*

*Lichen aggregatus*, Swartz Fl. Ind. Occid. t. 3, p. 1915.  
*Cenomyce aggregata*, Ach. Lichenogr. p. 563; Swartz Lich. Amer. p. 17, tab. 12;  
 Ach. Syn. p. 248; Hook. f. Bot. Antaret. Voy. t. 1, p. 197, tab. 80, f. 2.  
*Cladonia aggregata*, Eschw. Bras. l. c. p. 278 (nec Floerk. Clad. p. 170).  
*Cenomyce cornicularia* & *C. terebrata*, Laurer, cit. Floerk.  
*Cladonia cornicularia* & *C. terebrata*, Floerk. Clad. pp. 179-80.  
*Pycnothelia retipora*, Duf. cit. Fée Crypt. p. 98, tab. 3, f. 9.

HAB. Fuegia. New Zealand. Sidney, New South Wales.—A remarkable and wide-spread species, which I possess also from Brazil and from Nepal. The more erect state is exquisitely figured by Dr. Hooker, l. c.

13. CLADONIA MACILENTA, (*Ehrh.*) *Hoffm.*

*Lichen macilentus*, Ehrh. Crypt. n. 267, fide Ach. Syn. p. 266.  
*Cladonia macilenta*, Hoffm. Germ. p. 126; Fr. Lichenogr. p. 240; Lich. Suec. n.  
 52; Tuckerm. Lich. Exs. n. 134.

HAB. Bay of Islands, New Zealand. The typical state.

14. CLADONIA DIGITATA, (Linn.) Hoffm.

*Lichen digitatus* Linn. Fl. Suec. n. 114, fide Fr. infra cit.

*Cladonia digitata*, Hoffm. Germ. p. 124; Fries Lichenogr. p. 240; Lich. Suec. n. 85; Tuckerm. Lich. Exs. n. 39.

HAB. Port Discovery, Puget Sound, Oregon. Fuegia.

15. CLADONIA MUSCIGENA, Eschw. (Tab. 2, f. 3.)

*Cladonia muscigena*, Eschw. Bras. l. c. p. 262.

*Cenomyce sphærulifera*, Tayl. in Hook. Lond. Journ. Bot. 6, p. 185.

*Cladonia Hawaiensis*, Tuckerm. in litt.

HAB. Coast of Hawaii.—I refer this Lichen, with some confidence, to the species indicated by Eschweiler; which extends, if this view be correct, to Venezuela (Mr. Fendler) and Cuba (Mr. Wright), and even to Florida. Taylor's specimens, probably not distinguishable, were from Demerara. *C. isidioclada*, Montag. & Van den Bosch, in Mont. Syll. p. 336, and Lich. Javan. p. 31, to judge by specimens which I owe to the kindness of the authors, is exceedingly near; and *C. pulchella* (Schwein.) Tuckerm. Suppl. in Amer. Journ. Sci. 1858, p. 427, is possibly only a smaller state, less perfectly developed than the tropical Lichen, and approaching more closely to states of the northern species. *C. Mitrula*, Tuckerm., and *C. decorticata*, Floerk., with which last our plants have much in common, are analogous, normally symphy carpous forms of the brown-fruited series.

The artist has given two figures of clumps of the Hawaiian Lichen, which exhibit its short and stout habit; a feature, in which it differs from the South American specimens, which are all slender, and some of them rather elongated. The other figure is from a drawing by Mr. Sprague, and presents in *a*, a magnified view of a section of the summit of a podetium, with its inflated symphy carpous apothecium; and in *b*, a section of the disk of an apothecium, showing the spore-bearing layer (*thalamium*), the paraphyses, and several spore-sacks (*thecæ*); with the simple, ovate-ellipsoid, hyaline spores, common to many species of the

genus; and also the layer of densely packed small cells (*hypothecium*) which underlies the spore-bearing layer, and appears indeed to be the elementary tissue (Tulasne sur les Lich. t. 8, f. 57; Speerschnider in Bot. Zeit. 1854, pp. 237, 625, t. 7, f. 7, and 14, f. 6), of which the last is a metamorphosis. Towards the base the tissue of the hypothecium becomes looser and rather spongy, breaking here and there, as the empty interior of the podetium is approached, and presenting largish irregular cavities.

## 5. STEREOCAULON, Schreb.

### 1. STEREOCAULON RAMULOSUM, (Sw.) Ach.

*Lichen ramulosus*, Swartz Fl. Ind. Occid. 3, p. 1917.

*Stereocaulon ramulosum*, Ach. Lichenogr. p. 380; Swartz Lich. Amer. p. 20, t. 14; Ach. Syn. p. 284.

HAB. Fuegia. Mountains of Hawaii, Sandwich Islands. Walls of crater, East Maui; and mountains behind Honolulu, Oahu, Sandwich Islands. Tahiti. Bay of Islands, New Zealand.

### 2. STEREOCAULON MADERENSE, Sp. Nov.

*S. thallo a basi vage longeque versus apices parce breviterque ramoso; ramis subsimplicibus tomento tenui vestitis; phyllocladiis minusculis globosis confertis mox majoribus squamulosis crenatis vel sparsis vel dense imbricato-congestis; cephalodiis sessilibus scrobiculato-foveolatis subconcoloribus; apotheciis subterminalibus mediocribus albo-marginatis marginem demum excludentibus convexis nigro-fuscis. Sporæ (generis) aciculares varie septatæ.*

HAB. Pico Ruivo, Madeira.

Thallus stout, terete, and commonly naked at the mostly simple base; dividing below the middle into a few elongated, rather simple, erectish, obsoletely tomentose branches, with often nodding tips. Granules (*phyllocladia*, Th. Fries) very small, globose, somewhat scattered,

but becoming flat, and at length, especially on the branches, larger, crenate, and more densely heaped, glaucescent. *Cephalodia sessile*, scrobiculate-foveolate, of about the color of the phyllocladia. Apothecia subterminal, of middling size, flat, but at length nearly excluding the thick white margin, when the disk becomes turgid, and the remnant of the now colored thalline border appears as a thin, pale, proper margin. Spores of the genus. I should refer this Lichen to *S. leporinum*, Th. Fries (De Stereoc. Comm. p. 25), but the author of the species named, now refers it to *S. sphærophoroides*, Tuckerm. (Enum. N. A. Lich. p. 52), which is quite different from the present.

### 3. STEREOCAULON PASCHALE, (*Linn.*) *Fr.*

*Lichen paschalis*, Linn. Sp. Pl. p. 1631, & Fl. Suec. n. 1120, e. Fr. infra cit.

*Stereocaulon paschale*, Ach. Meth. p. 315, etc. pro parte; Fr. Lichenogr. p. 202; Tuckerm. Syn p. 45, & Lich. Exs. n. 112.

HAB. Fuegia, a dwarf form, with flattened podetia.

### 4. STEREOCAULON DENUDATUM, *Floerk.*

*Stereocaulon denudatum*, Floerk. D. Lich. 4, p. 13, n. 79, fide Sommerf. Suppl. p. 126; Laurer in Fr. Lichenogr. p. 204; Moug. & Nestl. Crypt. n. 446; Tuckerm. Lich. Exs. n. 114.

HAB. Summit of Pico Ruivo, Madeira. St. Jago, Cape Verde Islands.—Exactly agreeing with specimens collected near Naples, of *S. Vesuvianum*, Pers.; which is referred, I think correctly, to the present species, by Dr. Nylander (Enum. Gen. l. c. p. 97).

### 5. STEREOCAULON TENELLUM, *Sp. Nov.* (Tab. 2, fig. 2.)

*S. thallo cæspitoso pumilo gracillimo a basi vage apicemque versus fastigiato-ramoso tenuiter tomentoso glauco-albescente; phyllocladiis sparsis minusculis rotundatis mox pulveraceis; apotheciis ignotis.*

HAB. Near Lima, Peru.

Thallus growing in dense masses; very slender and fragile; dividing at the base irregularly into a few elongated, subsimple, terete branches, which are often fastigate-branched at the summit, and are clothed with a delicate tomentum; glaucous-white. Phyllocladia minute, rounded, becoming powdery, loosely scattered, but rather more numerous above; Cephalodia obscure; apothecia wanting. Nearest to *S. nanum*, but a larger and more branched lichen. It is quite distinct from *S. nanodes*, Tuckerm. (Suppl. Enum. Lich. N. Amer.), nor have I seen anything like it in North America; but it is possibly identical with *S. albicans*, Th. Fries (l. c. p. 36), from Peru. The figures exhibit, 1. the habit of our specimen, and 2, a portion slightly magnified.

## 6. SIPHULA, Fr.

### 1. SIPHULA PICKERINGII, Sp. Nov. (Tab. 2. fig. 4).

*S. thallo cæspiticio fragili glabro subdichotomo-ramoso e glauco albicante; ramis erectiusculis tereti-compressis demum sulcatis; apotheciis lateralibus.*

HAB. Mountains behind Honolulu, Oahu, Sandwich Islands; growing on the earth, among mosses.

Cæspitose; the very fragile fronds dividing irregularly near the base into more or less dichotomous, erectish, smooth, terete-compressed, at length pitted and furrowed branches; the abortive apothecia (exhibited in Fig. 2) appearing to be lateral. Both the habit and the structure appear to connect this lichen with *Siphula*, and it is undoubtedly an undescribed species, but the specimen is too imperfect for farther elucidation. *Siphula pteruloides*, Nyl., from Peru, of which a brief diagnosis has just appeared (Oct. 1859) in the "Lichenes Exotici" of Dr. Nylander, also from infertile specimens, should be compared with the Oahu Lichen, which considerably resembles *Pterula subulata* of Moug. & Nestl. Crypt. Vog. n. 995, cited by the former author, as expressing the habit of his species.—Our first figure represents the largest specimen, and the second a slightly magnified branch, with abortive apothecia.

7. USNEA, *Dill., Ach.*1. USNEA BARBATA, (*Linn.*) *Fr.*

*Lichen barbatus* & *L. floridus*, Linn. & Auctt.

*Usnea barbata*, Fr. Lichenogr. p. 18.

Var.  $\alpha$ . FLORIDA, Fr. l. c.

HAB. Andes of Peru. Organ Mountains, Brazil. Rio Janeiro. Hawaii, Sandwich Islands. Tahiti. New Zealand. Sydney, New South Wales.

Var.  $\delta$ . DASYPOGA, Fr. l. c.

HAB. Pico Ruivo, Madeira. Emio, Society Islands. Tonga. Samoan Islands. What appears to be a smoother variety from Ovolau, Feejee Islands; and a similar Lichen from Fuegia.

Var.  $\epsilon$ . ARTICULATA, Fr. l. c.

HAB. Pico Ruivo, Madeira.

2. USNEA AURANTIACO-ATRA, *Jacq.* (Tab. 1, fig. 1.)

*Lichen aurantiaco-ater*, Jacq. Miscell. 2, tab. 11, fig. 2, cit. Ach.

*Usnea melaxantha*, Ach. Meth. p. 307, & Syn. p. 303; Montag. Pol. Sud. p. 201;

Hook. f. Bot. Antaret. Voy. t. 2, p. 519.

*Neuropogon melaxanthus*, Nyl. Enum. l. c. p. 98.

*Usnea sphacelata*, R. Br. in Parry's 1st Voy. Append. p. 307; Hook. Bot. Miscell. 1, p. 15, t. 12.

*Usnea fasciata*, Torr. in Amer. Journ. Sci. 6; Hook. l. c. p. 14, t. 11.

HAB. Fuegia.—Original specimens of the Lichen upon which *U. sphacelata*, was founded, from Melville Island (Herb. Ch. Babington), and others, not distinguishable, from Spitzbergen, given to me by the late Dr. Vahl, appear to differ only in their dwarf habit from the Antarctic plant. The latter was first published; nor does there seem

to be reason for supplanting the name then given to it by any of the later ones.—The figure, tab. 1, f. 1, exhibits the finest specimen obtained, of its natural size. The rest of the figures are from Mr. Sprague's drawings :—2, shows a portion of a branch with the simple terminal branchlets, and bearing a mature apothecium, slightly magnified; 3, a cutting lengthwise of the same apothecium, more highly magnified, and displaying the spore-bearing layer (*thalamium*) as it is received in the exciple (*hypothecium*); 4, a yet more highly magnified portion of the apothecium, showing the spore-sacks (*theccæ*) with their contents, and the paraphyses, appearing to rest immediately on the small cells of the hypothecium, which itself appears to pass into the looser filamentous tissue of the next adjoining part of the medullary layer; 5, exhibits a smaller fragment of the apothecium, in which the spore-sacks and paraphyses, retaining their natural position, are exhibited still larger, as well as the minute, globose-oblong, simple spores, which, with slight differentiation, characterize the genus; and 6, a cross-cutting of a branch of the thallus, showing (what is better shown in a vertical section) the compacter tissue of the almost woody axis becoming looser, and with more of the features of the ordinary medullary layer, at the outer side, where scattered gonidial cells indicate the discontinuous gonimous layer, immediately beyond which begins the cortical layer.

## 8. ALECTORIA, Ach.

### 1. ALECTORIA JUBATA, (Linn.) Ach.

*Lichen jubatus*, Linn. Sp. Pl. p. 1623; Sm. E. Bot. t. 1880.

*Alectoria jubata*, Ach. Lichenogr. p. 592; Syn. p. 291; Nyl. Prodr. p. 45.

*Evernia jubata* (a excl.), Fr. Lichenogr. p. 20; Montag. Canar. l. c. p. 94.

HAB. Summit of Pico Ruivo, Madeira. Orange Harbor, Fuegia (var. *β. chalybeiformis*, Ach.). Sippen River, Oregon (var. *γ. implexa*, Fr.).

### 2. ALECTORIA SARMENTOSA, Ach.

*Lichen sarmentosus*, Ach. in Vet. Ac. Handl. 1797, p. 212, tab. 8, f. 2.

*Alectoria sarmentosa*, Ach. Lichenogr. p. 595; Syn. p. 293; Nyl. Prodr. p. 46.

*Evernia ochroleuca*, var. *sarmentosa*, Fr. Lichenogr. p. 22; Lich. Suec. n. 269.

HAB. Pico Ruivo, Madeira. Fort Nesqually, and Port Discovery, Oregon.

9. EVERNIA, *Ach. Fr.*

1. EVERNIA VULPINA, (*Linn.*) *Ach.*

*Lichen vulpinus*, Linn. Sp. Pl. p. 1623; Fl. Dan. t. 226.

*Cornicularia vulpina*, De Cand. Fl. Fr. 2, p. 329.

*Evernia vulpina*, Ach. Lichenogr. p. 23; Syn. p. 245; Fr. Lichenogr. p. 23; Tuckerm. Lich. exs. n. 53.

*Chlorea vulpina*, Nyl. Prodr. p. 45.

HAB. Spipen River, Oregon; very luxuriantly fertile.

2. EVERNIA TRULLA, (*Ach.*) *Nyl.*

*Parmelia trulla*, Ach. Meth. p. 256, tab. 4, f. 6.

*Borrera trulla*, Ach. Lichenogr. p. 496; Syn. p. 220.

*Evernia trulla*, Nyl. Enum. Gen. l. c. p. 99.

*Parmelia denudata*, Hamp. in Linnæa, 17, p. 121.

HAB. Andes of Peru; with *spermogonia*, but without *apothecia*.

3. EVERNIA FURFURACEA, (*Linn.*) *Mann.*

*Lichen furfuraceus*, Linn. & Auctt.; Sm. E. Bot. t. 984.

*Borrera furfuracea*, Ach. Lichenogr. p. 500; Syn. p. 222.

*Evernia furfuracea*, Mann Lich. Boh. p. 105, cit. Fr. Lichenogr. p. 26; Tuckerm.

Lich. exs. n. 55; Nyl. Prodr. p. 47.

HAB. Summit of Pico Ruivo, Madeira; fertile. Near Lima, Peru; infertile.

4. EVERNIA PRUNASTRI, (*Linn.*) *Ach.*

*Lichen prunastri*, Linn. & Auctt.; Sm. E. Bot. t. 859.



*Evernia prunastri*, Ach. Lichenogr. p. 442; Fr. Lichenogr. p. 25; Tuckerm. Lich. exs. n. 54; Nyl. Prodr. p. 46.

HAB. Port Discovery, Puget Sound, Oregon; infertile.

5. *EVERNIA CANARIENSIS*, (Ach.) Montag. (Tab. 1, fig. 2.)

*Usnea dichotoma compressa segmentis capillaceis teretibus*, Dill. Musc. tab. 13. f. 15.

*Alectoria Canariensis*, Ach. Lichenogr. p. 597; Syn. p. 293.

*Evernia Canariensis*, Montag. Pl. Cell. in Webb & Berthel. Hist. Canar. p. 95, tab. 6, f. 1.

*Chlorea Canariensis*, Nyl. Enum. l. c. p. 98.

HAB. Tongatabu; infertile.—Agrees better with specimens of the Canary lichen, from Dr. Montagne, than with the description of Acharius. A single infertile sample was all that was obtained, the habit of which is sufficiently exhibited by the figure.

10. *RAMALINA*, Ach.

1. *RAMALINA USNEOIDES*, (Ach.) Montag.

*Lichen Usnea*, L. Mant. 131 (Dill. Hist. Musc. t. 84, fig. 10).

*Parmelia usneoides*, Ach. Meth. p. 270.

*Alectoria usneoides*, Ach. Lichenogr. p. 594; Syn. p. 292.

*Ramalina usneoides*, Montag. Crypt. Bras. in Ann. Sci. Nat. 12, p. 46.

HAB. Near Lagunas and Valparaiso, Chili.

2. *RAMALINA MENZIESII*, Tayl.

*Ramalina Menziesii*, Tayl. in Hook. Lond. Journ. Bot. 6, p. 189 (1847), Tuckerm. Lich. exs. n. 57.

*Ramalina retiformis* (Menz. herb), Tuckerm. Synops. Lich. N. E. p. 12 (1848); Nyl. Enum. l. c. p. 99.

HAB. Fort Nesqually, Puget Sound, and Port Discovery, Oregon. Sacramento River, California.

3. RAMALINA SCOPULORUM, (*Retz.*) *Ach.*

*Lichen scopulorum*, Retz. Obs. Bot. 4, p. 30, cit. Ach.

*Ramalina scopulorum*, Ach. Lichenogr. p. 604; Syn. p. 297; Fr. Lichenogr. p. 32;  
Lich. Suec. n. 300; Nyl. Prodr. p. 48.

HAB. Kaala Mountains. Society Islands, Oahu. Wilson's Islands,  
Paumotu group. Tonga, Fejee, and Samoan Islands.

4. RAMALINA ATTENUATA, (*Pers.*) *Montag.* (Tab. 1, fig. 3.)

*Phycia attenuata*, Pers. in Act. Wetterav. fide cel. Montag.

*Ramalina attenuata*, Montag. herb.

HAB. Rio Janeiro. Mountains of Tahiti. Hawaii, Sandwich Islands,  
and Emio, Society Islands.—The lichen from the first-mentioned  
locality is what is figured, but the others appear to agree with it. It  
is perhaps too near to some extreme forms of the last species. The  
attenuate habit of the plant is shown in the figure.

5. RAMALINA RIGIDA, (*Pers.*) *Ach.*

*Lichen rigidus*, Pers. in schedula, ex. Ach. Syn. infra cit.

*Ramalina rigida*, Ach. Syn. p. 294; Montag. Cuba, l. c. p. 235.

HAB. Rio Janeiro, Brazil.

6. RAMALINA LÆVIGATA, *Fr.*

*Ramalina lævigata*, Fr. Pl. Homon. p. 283, fide ill. auctoris.

*Cornicularia* dein *Parmelia Berterii*, Spreng. Syst. 4, 1, p. 279.

*Parmelia Eckloni*, Spreng. l. c. Cur. Post. p. 328; Mey. & Flot. in Nov. Act. Nat.

Cur. 19, Suppl. p. 213; Nyl. Enum. l. c. p. 100.

*Parmelia Celastri*, Spreng. l. c. fide Hamp. in herb. Berol.

*Ramalina fraxinea* var. *membranacea*, Laur. in Linnæa, 2, p. 43, fide sched. in herb.  
Berol.

*Ramalina prolifera*, Kunz. herb.

*Ramalina striatula*, N. ab. Esenb. fide herb. Kunz.

*Ramalina sepacea*, Pers. ined. in herb. Montag.

*Ramalina microcarpa*, Pers. ined. fide. cl. Van den Bosch.

HAB. Lagunas and Valparaiso, Chili.—Found throughout South America, and northward to Texas (Mr. Wright), and Louisiana (Dr. Hale). It is also a native of Nepal (Herb. Hook.) and other parts of the East Indies; of New Holland (Sieber) and of South Africa. *R. straminea* (Pers.) Ach. possibly relates to this lichen; but Persoon's description is too imperfect, as Acharius (Syn. p. 295) admits, to determine anything. *Parmelia Berterii*, Spreng., under its earlier designation of *Cornicularia* (Neue Entd. p. 98, fide auct.) may be next in priority, but cannot be taken for a precise determination, as the author not only included in his species the distinct *R. rigida* (Pers.) Ach., but subsequently described the Cape form of our Lichen as a new species (*R. Eckloni*), and again (*R. Celastri*). There remains the name given by Fries, which was, if we are not mistaken in the above, the first distinct indication of what has proved a remarkable and widespread species.

#### 7. RAMALINA HOMALEA, Ach.

*Ramalina homalea*, Ach. Lichenogr. p. 598; Syn. p. 594; Nyl. Enum. Gen. Lich. l. c. p. 100.

*Usnea homalea*, Fr. Pl. Homon. p. 234; Tuckerm. Enum. Lich. Amer. p. 47.

*Desmazieria homalea*, Mont. Chil. l. c. p. 68; Syll. p. 318.

HAB. San Francisco, California. Fuegia.—Presenting the whole aspect of *Usnea*, but the spores agree with those of the present genus.

#### 11. CETRARIA, Ach.

##### 1. CETRARIA ACULEATA, (Ehrh.) Fr.

*Lichen aculeatus*, Ehrh. Crypt. n. 198, cit. Schær. Spicil. 1, p. 254.

*Cornicularia aculeata*, Ach. Lichenogr. p. 612; Syn. p. 299.

*Cetraria aculeata*, Fr. Lichenogr. p. 35; Lich. Suec. n. 261; Montag. Canar. l. c.; Nyl. Prodr. p. 48.

HAB. Summit of Pico Ruivo, Madeira; infertile.

2. CETRARIA JUNIPERINA, (*Linn.*) *Ach.*

*Lichen juniperinus*, Linn. Fl. Suec. n. 1093, & Auctt. ; Hoffm. Enum. t. 22, fig. 1.  
*Cetraria juniperina*, Ach. Lichenogr. p. 506 ; Syn. p. 226 ; Fr. Lichenogr. p. 40 ;  
Lich. Suec. n. 171.  
*Platysma juniperinum*, Nyl. Prodr. p. 49.

HAB. Spipen River, Oregon ; fertile.

3. CETRARIA GLAUCA, (*Linn.*) *Ach.*

*Lichen glaucus*, Linn. Fl. Suec. n. 1094 ; Sm. E. Bot. t. 1606.  
*Cetraria glauca*, Ach. Lichenogr. p. 509 ; Syn. p. 227 ; Fr. Lichenogr. p. 38 ; Lich.  
Suec. n. 112.  
*Platysma glaucum*, Nyl. Prodr. p. 49.

HAB. Port Discovery, Puget Sound, and Fort Nesqually, Oregon.  
Summit of Pico Ruivo, Madeira. Infertile.

4. CETRARIA SEPINCOLA, (*Ehrh.*) *Ach.*

*Lichen sepincola*, Ehrh. Beytr. cit. Schær. ; Hoffm. Enum. t. 17, f. 1.  
*Cetraria sepincola*, Ach. Lichenogr. p. 507 ; Syn. p. 227 ; Fr. Lichenogr. p. 39 ; Lich.  
Suec. n. 170.  
*Platysma sepincola*, Nyl. Prodr. p. 49.

HAB. Port Discovery, Oregon (var. *ulophylla*). Fuegia ; apparently  
the same form, but the specimen far from good.

12. NEPHROMA, *Ach.*1. NEPHROMA ARCTICUM, (*Linn.*) *Fr.*

*Lichen arcticus*, Linn. Fl. Suec. n. 1099 ; Fl. Lapp. n. 442 ; & Auctt.  
*Lichen antarcticus*, Jacq. Miscell. 2, tab. 10, f. 1, cit. Fr.  
*Peltidea polaris*, Ach. Meth. p. 288.  
*Nephroma polare*, Ach. Syn. p. 241.

*Nephroma arcticum*, Fr. Summ. Fl. Scand. p. 101; Tuckerm. Lich. exs. n. 62; Nyl. Enum. l. c. p. 101.

HAB. Orange Harbor, Fuegia; fertile.

## 2. NEPHROMA LÆVIGATUM, Ach.

*Nephroma lævigatum*, Ach. Syn. p. 242.

*Peltidea lævigata*, Sommerf. Suppl. Lapp. p. 125.

*Nephromium lævigatum*, Nyl. Enum. Gen. l. c. p. 101.

HAB. Summit of Pico Ruivo, Madeira; fertile. Also among Mosses, Hawaii; but the specimen very imperfect.

## 13. PELTIGERA A, Hoffm.

### 1. PELTIGERA APHTHOSA, (Linn.) Hoffm.

*Lichen apthosus*, Linn. Fl. Suec. n. 1098; & Auctt.

*Peltigera apthosa*, Hoffm. Fl. Germ. p. 107; Fr. Lichenogr. p. 44; Tuckerm. Lich. exs. n. 9, & 102.

*Peltidea apthosa*, Ach. Lichenogr. p. 516; Syn. p. 238.

HAB. Port Discovery, Puget Sound.

### 2. PELTIGERA CANINA, (Linn.) Hoffm.

*Lichen caninus*, Linn. Fl. Suec. n. 1100; Sm. E. Bot. t. 2299.

*Peltigera canina*, Hoffm. l. c. p. 106; Fr. Lichenogr. p. 45; Lich. Suec. n. 111; Tuckerm. Lich. exs. n. 103.

*Peltidea canina*, Ach. Syn. p. 239, excls. var.  $\gamma$ , &  $\varsigma$ .

HAB. Puget Sound, Oregon.

### 3. PELTIGERA RUFESCENS, (Neck.) Hoffm.

*Lichen rufescens*, Necker Meth. 79, cit. Ach.; E. Bot. t. 2300.

*Peltigera rufescens*, Hoffm. l. c. p. 107; Fr. Lichenogr. p. 46; Tuckerm. Lich. exs. n. 104.

*Peltidea canina*, var. *crispa*, Ach. Lich. Univ. p. 519; Syn. p. 239.

HAB. Walls of the crater, East Maui, Sandwich Islands.

#### 4. PELTIGERA POLYDACTYLA, (*Neck.*) Hoffm.

*Lichen polydactylus*, Necker Meth. 85, cit. Ach. infra.

*Peltigera polydactyla*, Hoffm. l. c. p. 106; Fr. Lichenogr. p. 46; Tuckerm. Lich. exs. n. 10.

*Peltidea polydactyla*, Ach. Lichenogr. p. 519; Syn. p. 240.

HAB. Fort Nesqually, Oregon. Hawaii, and Kaala Mountains, Oahu, Sandwich Islands. Bay of Islands, New Zealand.

VAR. FUEGENSIS: *thallo atroviridi lobulis angustatis subtus efibrilloso tomentoso venis crassis reticulato; apotheciis horizontalibus nigrofuscis.* (Tab. 1, fig. 5.)

HAB. Orange Harbor, Fuegia.

Thallus smallish, dark blackish-green, dividing into numerous narrow lobules; beneath without fibres, but delicately tomentose, and with prominent darker veins; the dark-fuscous apothecia transversely oblong and horizontal.—Appearing in some respects intermediate between the variety *a*, Fr., and *β. scutata*, Fr. There is but a single specimen; but the aspect of this is so peculiar, that I am unwilling to pass it by without notice. The habit of the Lichen is well displayed in Figure 1. The other drawings are by Mr. Sprague;—2, shows a lobe of the thallus, with an apothecium, slightly magnified; 3, a portion of the lobe and apothecium cut lengthwise; 4, a smaller portion of the apothecium, highly magnified, showing the filamentous medullary layer appearing to pass into the denser cellular tissue of the hypothecium, which is crowned by paraphyses, amongst which appear two spore-sacks, containing imperfect spores; and 5, a vertical section of the same lobe, exhibiting the cortical layer passing into the medullary, a few clusters of gonidial cells between these layers indicating the discontinuous green stratum, while the medullary layer is seen to pass

at the under side (without the interposition of an epidermis, as in the nearly related *Nephroma*), into the processes—in this case, anastomosing tomentose veins—by which the Lichen is affixed to its matrix.

#### 14. STICTA, *Schreb., Ach.*

##### 1. STICTA PULMONARIA, (*Linn.*) *Ach.*

*Lichen pulmonarius*, Linn. Fl. Suec. n. 1087; Sm. E. Bot. t. 572.

*Sticta pulmonacea*, Ach. Lichenogr. p. 449; Syn. p. 233; Delis. Hist. Stict. p. 139; Fr. Lichenogr. p. 53; Tuckerm. Lich. exs. n. 68.

HAB. Fort Nesqually, and Spipen River, Oregon.

##### 2. STICTA RETIGERA, (*Bory*) *Ach.*

*Lichen retiger*, Bory, Voy. 3, p. 101, citante Ach. infra.

*Sticta retigera*, Ach. Lichenogr. p. 455; Syn. p. 233; Delis. Stict. p. 147; Montag. & Van den Bosch Lich. Javan. p. 15.

HAB. Bay of Islands, New Zealand.—In the determination of the species of this, on many accounts, difficult genus, I have been especially aided by a large set of specimens from the herbarium of Delise, which I owe to the liberality of Mr. Lenormand; and in several puzzling instances, by the kindly communicated observations of Dr. Montagne.

##### 3. STICTA SCROBICULATA, (*Scop.*) *Ach.*

*Lichen scrobiculatus*, Scopol. Fl. Carn. n. 1391; Sm. E. Bot. t. 497.

*Sticta scrobiculata*, Ach. Lichenogr. p. 453; Syn. p. 234; Delis. Stict. p. 153; Fr. Lichenogr. p. 53; Tuckerm. Lich. exs. n. 67.

HAB. Madeira, upon trees; infertile.

##### 4. STICTA FILIX, (*Sw.*) *Ach.*

*Lichen Filix*, Sw. Meth. Musc. in Act. Med. Suec. 1, p. 201, tab. 15, f. 1, cit. Ach.; Ejusd. Fl. Ind. Occ. 3, p. 1904.

*Platisma Filix*, Hoffm. Pl. Lich. 3, tab. 55.

*Sticta filicina*, Ach. Lichenogr. p. 445; Syn. p. 230; Delis. Stict. p. 105; Montag. in Ann. Sci. t. 18, p. 6.

HAB. Bay of Islands, New Zealand (var. *latifrons*). Feejee Islands.

#### 5. STICTA DAMÆCORNIS, (*Sw.*) *Ach.*

*Lichen damæcornis*, Sw. Fl. Ind. Occ. 3, p. 1900.

*Sticta damæcornis*, Ach. Lichenogr. p. 446; Syn. p. 231 (*c* excl.); Delis. Stict. p. 105.

HAB. Mountains of Tahiti. Samoan Islands. Feejee Islands (var. *quercifolia*, Eschw. Bras. l. c. p. 215). Andes of Peru. Organ Mountains, Brazil (var. *pinnatifida*, Eschw. l. c.).

#### 6. STICTA CANARIENSIS, (*Bory*) *Delis.*

*Pulmonarea Canariensis*, Bory, Voy. ex Ach. infra cit.

*Sticta Canariensis*, Delis. Stict. p. 114, tab. 11, f. 45; Montag. herb.

*Sticta damæcornis*, var. *c*, Ach. Syn. p. 231.

HAB. Pico Ruivo, Madeira. Direction Islands, Feejee.—A doubtful species, of an exceedingly perplexing group.

#### 7. STICTA DICHOTOMA, (*Bory*) *Delis.*

*Lichen (Pulmonarea) dichotomus*, Bory, Voy. cit. Delis. infra.

*Sticta dichotoma*, Delis. Stict. p. 107, tab. 9, f. 40; Montag. & Van den Bosch Lich. Javan. p. 12.

*Sticta Richardi* var. *pallida*, Mey. & Flot. in Nov. Act. Nat. Cur. 19, Suppl. p. 216, fide Montag.

HAB. Bay of Islands, New Zealand. Sandalwood Bay, Feejee Islands.

#### 8. STICTA QUERCIZANS, (*Michx.*) *Ach.*

*Lobaria quercizans*, Michx. Fl. Bor.—Am. 2, p. 324.

*Parmelia quercizans*, Ach. Lichenogr. p. 464.



*Sticta quercizans*, Ach. Syn. p. 234; Delis. Stict. p. 84; Tuckerm. Synops. Lich. N. E. p. 22, & Lich. exs. n. 66.

*Sticta Beauvoisii*, Delis. Stict. p. 83.

HAB. Near Hido, Hawaii.—A small fragment, referred here on the authority of Dr. Nylander.

9. *STICTA VARIABILIS*, (*Bory*) *Ach.* var. *BORYANA*, *Nyl.*

*Lichen (Pulmonarea) calvus*, Bory in herb. cit. Delis.

*Sticta Boryana*, Delis. Stict. p. 102, tab. 8, f. 37.

*Sticta variabilis*, var. *Boryana*, Nyl. Enum. Gen. l. c. p. 102.

HAB. Feejee Islands. Bay of Islands, New Zealand.

10. *STICTA ARGYRACEA*, (*Bory*) *Delis.*

*Lichen argyraceus*, Bory, Voy. cit. Delis. infra.

*Sticta argyracea*, Delis. Stict. p. 91, t. 7, f. 30; Montag. Chil. l. c. p. 116; Montag. & Van den Bosch. Lich. Javan. p. 10.

HAB. Waya-ruru Bay, New Zealand.

11. *STICTA FREYCINETII*, *Delis.*

*Sticta Freycinetii*, Delis. Stict. p. 124, tab. 14, f. 51.

HAB. Orange Harbor, Fuegia.

12. *STICTA ANTHRASPIS*, *Ach.*

*Sticta anthrasis*, Ach. Meth. p. 280, e specim. b. m. Menzies; Ach. Lichenogr. p. 449; Syn. p. 233.

*Sticta cellulifera*, Tayl. in Hook. Lond. Journ. Bot. 3, p. 647, e specim. b. m. auctoris.

HAB. Orange Harbor, Fuegia.—First discovered by Mr. Menzies, from whom Acharius had his specimen, at "Port Wentworth, N. W.

coast of America." A specimen given to me by the former does not differ from the Lichen from Orange Harbor, nor from original specimens of Dr. Taylor's species (from Auckland's and Campbell's Island) in the herbarium of Professor Gray.

13. STICTA TOMENTOSA, (Sw.) Ach.

*Lichen tomentosus*, Swartz, Fl. Ind. Occ. 3, p. 1903.

*Sticta tomentosa*, Ach. Meth. p. 279; Lichenogr. p. 450; Syn. p. 234; Delis. Stict. p. 73, tab. 6, f. 19.

HAB. Peru. Forests of Mauna Kea, Hawaii, Sandwich Islands.

14. STICTA FAVEOLATA, Delis.

*Sticta faveolata*, Delis. Stict. p. 101, tab. 8, f. 36; Montag. Pol. Sud. p. 186.

HAB. Bay of Islands, New Zealand. Feejee Islands.—A fragment from near Valparaiso varies in a fuscous thallus, with shorter lobes, and apparently also in the spores. Dr. Nylander, to whom I sent it, refers this to his var. *cervicornis* (Flot.), Nyl. ined.

15. STICTA DISCOLOR, (Bory), Delis.

*Lichen (Pulmonarea) discolor*, Bory, Voy. e Delis. infra.

*Sticta discolor*, Delis. Stict. p. 136, tab. 16, f. 59.

*Ricasolia discolor*, Nyl. Enum. Gen. l. c. p. 103.

HAB. Mountains of Tahiti, Society Islands.

16. STICTA CARPOLOMA, Delis.

*Sticta carpoloma*, Delis. Stict. p. 159, tab. ult. fig. dextr.; Montag. Fl. Fernand. p. 113; Babingt. Lich. N. Zeal. p. 12, tab. 126.

HAB. Tahiti, Society Islands. Feejee Islands.

17. STICTA ENDOCHRYSA, *Delis.*

*Sticta endochrysa*, Delis. Stict. p. 43, tab. 1, f. 1; Hook. f. Bot. Antart. Voy. 2, p. 525, tab. 195, f. 2.

HAB. Orange Harbor, Fuegia.

18. STICTA ORYGMÆA, *Ach.*

*Sticta orygmæa*, Ach. Lichenogr. p. 449; Syn. p. 233; Delis. Stict. p. 46, tab. 1, f. 3; Montag. Pol. Sud, p. 190, tab. 15, f. 1.

HAB. Orange Harbor, Fuegia.

## 19. STICTA PICKERINGII, Sp. Nov. (Tab. 1. fig. 6, 1, 2.)

*S. thallo cartilagineo lævi laciniato e glauco flavescente demum et fuscescente, lobis sinuatis rotundatis, marginibus elevatis plus minus vel lac-ratis vel foliolis pulvinulisve coralloideis exasperatis, subtus leviter tomentoso ambitu fusco-flavescente centro demum nigrescente; cyphellis punctiformibus citrinis; apotheciis sparsis, disco demum convexo rufo-nigro margine crassiusculo incurvo, extus ruguloso-papillosis.*

HAB. Bay of Islands, New Zealand.

Frond smallish, apparently somewhat rosulate, sinuate-lobate, the lobules rounded and sinuate-laciniate, and their elevated margins becoming at length thickly beset with leaflets and coralloid branchlets; glaucous-flavescence, or, at length, darker. Under side tomentose, yellowish-brown, becoming blackish at the centre. Cyphellæ punctiform. Apothecia of middling size, pedicellate, the disc at length a little convex, reddish-black, the margin, and indeed the whole outside, rugulose-papillate.—Dedicated to Charles Pickering, M.D., &c., one of the Naturalists to the Expedition.

20. STICTA CROCATI, (*Linn.*) *Ach.*

*Lichen crocatus*, Linn. Mant. 310; Dicks. Crypt. fasc. 2, p. 22.

*Sticta crocata*, Ach. Lichenogr. p. 447 ; Syn. p. 232 ; Delis. Stict. p. 56, tab. 4, f. 10 ; Montag.-Pol. Sud, p. 190 ; Tuckerm. Lich. exs. n. 65.

HAB. Walls of crater, East Maui, and in Hawaii, Sandwich Islands.

## 21. STICTA AURATA, (Sm.) Ach.

*Lichen auratus*, Sm. Eng. Bot. t. 2359.

*Sticta aurata*, Ach. Lichenogr. p. 448 ; Syn. p. 232 ; Delis. Stict. p. 49, tab. 2, f. 5.

*Parmelia aurata*, Eschw. Bras. l. c. p. 216, tab. 14, f. 1.

*Platisma crocatum*, Hoffm. Pl. Lich. 2, tab. 38, f. 1, 2, 3.

HAB. Pico Ruivo, Madeira. Rio Janeiro, Brazil. Baños, Andes of Peru. Bay of Islands, New Zealand.

## 15. PARMELIA, Ach., Nyl.

### 1. PARMELIA PERLATA, (Linn.) Ach.

*Lichen perlatus*, Linn. & Auctt. ; Wulf. in Jacq. Coll. 4, p. 273, t. 10.

*Parmelia perlata*, Ach. Lichenogr. p. 458 ; Syn. p. 197 ; Fr. Lichenogr. p. 59 ; Montag. Cuba, l. c. p. 231 ; Tuckerm. Lich. Exs. n. 15 ; Nyl. Prodr. p. 54.

HAB. Rio Janeiro. Hawaii. Mountains of Tahiti; the apothecia sometimes, as also in the North American Lichen, perforate. (Comp. Eschw. Bras. l. c. p. 207.) Tonga Islands.

### 2. PARMELIA PERFORATA, (Jacq.) Ach.

*Lichen perforatus*, Jacq. Coll. t. 1, p. 116, tab. 3, cit. Fr. infra.

*Parmelia perforata*, Ach. Lichenogr. p. 459 ; Syn. p. 198 ; Fee. Cryptog. tab. 32, f. 3 ; Tuckerm. Lich. Exs. n. 69.

*Platisma perforatum*, Hoffm. Pl. Lich. 1, tab. 13.

*Parmelia coriacea perforata*, Eschw. Bras. l. c. p. 206.

HAB. Madeira; infertile. Rio Janeiro. Organ Mountains, Brazil. Forests of Hawaii. Bay of Islands, New Zealand.

3. *PARMELIA SINUOSA*, (Sm.) Fr.

*Lichen lævigatus*, dein *sinuosus*, Sm. E. Bot. tab. 1852, et 2050.

*Parmelia sinuosa*, Ach. Syn. p. 507 et.

*Parmelia lævigata*, Ach. Syn. p. 212 (cf. Mey. Nebenst. p. 50).

*Parmelia sinuosa*, Fr. Lichenogr. p. 63; Montag. Chil. l. c. p. 131.

HAB. Hawaii, Sandwich Islands.

4. *PARMELIA CERVICORNIS*, Sp. Nov. (Tab. 2, fig. 1).

*P. thallo foliaceo expanso cartilagineo lævigato glaucescente, laciniis elongatis laxè implexis vel subimbricatis linearibus plano-concavis irregulariter subdichotomo-divisis apice bifidis obtusis, subtus atris papillosis vel præsertim ad margines villosio-fibrillosis; apotheciis scutelliformibus subpedicellatis demum explanatis, disco badio margine integerrimo. — Sporæ in thecis suboctonæ, majusculæ, ovoideo-ellipsoideæ, simplices, hyalinæ.*

HAB. Forests of Hawaii, Sandwich Islands.

Thallus foliaceous, horizontal, appressed, cartilagineous, smooth, glaucescent, of loosely imbricated, elongated-linear, plano-concave lobes, which are irregularly dichotomous, and with forked, divergent, obtuse tips. The under side is black and covered rather sparsely with small papillæ, which pass here and there, especially at the margins, into branched, densely crowded fibrillæ. Apothecia large, elevated-subpedicellate, scutelliform, at length explanate, and the dark chestnut-colored disk more or less covered by the incurved portions of the at first entire, but at length coarsely crenate-cut margin. Spores largish, ovoid-ellipsoid, simple, hyaline.—Nearest to the last species, but itself approached closely by the largest states of '*P. Camtschadalis*, Eschw. (*Borrera*, Ach., *Parm. cirrhata*, Fr. Pl. Homon. p. 283? e descr. *P. Americana*, Montag. Chil. l. c. p. 137.) Of the latter I possess numerous specimens, both from South America and India, and find them constantly different from our *Lichen* in their Everniaceous habit, which reminds one at once rather of *Evernia furfuracea*, than of any true *Parmelia*. There is no question of the generic position of our plant,

and if it shall prove to be identical in species with the other just mentioned, it may be taken for the Parmeliaceous type of a species mainly represented by aberrant Everniaceous forms. The spores of the Indian and South American lichens referred above to *P. Camtschadalis*, are smaller than those of the Hawaiian Lichen, and less ovoid; their *protoplasma* is commonly less simple, developing not unfrequently into two or more oily globules (*sp. oleoso-monoblastæ*, Koerb.)

Figure 1 exhibits the habit of the Lichen, in the largest specimen or clump which was obtained; Figure 2, a specimen with apothecia; and Figure 3, one showing the under side, all of natural size. The other figures are by Mr. Sprague:—4, showing a large apothecium cut lengthwise, the spore-bearing layer and hypothecium, as they appear, slightly magnified; 5, a portion of the inner part of the same, highly magnified, the medullary layer at the bottom appearing well defined at its point of union with the close tissue of the hypothecium, and the latter at least equally distinct where it appears to receive the vertical paraphyses and spore-sacks (*thecæ*); 6, a single spore-sack, with several paraphyses, and containing six mature spores.

#### 5. PARMELIA PHYSODES, (Linn.) Ach.

*Lichen physodes*, Linn. Fl. Suec. n. 1081; Sm. E. Bot. t. 126.

*Parmelia physodes*, Ach. Lichenogr. p. 492; Syn. p. 218; Montag. Canar. l. c. p. 119; Tuckerm. Lich. Exs. n. 72; Nyl. Prodr. p. 56.

HAB. New Zealand.

Var. VITTATA (Ach.): *laciniis effusis linearibus subprolificantibus planiusculis nigro-marginatis*.

HAB. Pico Ruivo, Madeira.

Var. ENTEROMORPHA (Tuckerm.): *laciniis effusis laxis ventricosoinflatis; apotheciis ventricosocyathiformibus demum explanatis*.

*Parmelia enteromorpha*, Ach. Lichenogr. p. 494; Syn. p. 219.

*Parmelia physodes*, var. *enteromorpha*, Tuckerm. Synops. N. E. p. 28, & Lich. Exs. n. 73; Nyl. Enum. Gen. l. c. p. 104.

HAB. Fort Nesqually, and Puget Sound, Oregon.

6. *PARMELIA PERTUSA*, (*Schrank*) *Schær.*

*Lichen pertusus*, Schrank, Fl. Bavar. n. 1513, cit. Hoffm.

*Parmelia pertusa*, Schær. Spicil. p. 457; Nyl. Prodr. p. 56.

*Lobaria terebrata*, Hoffm. Fl. Germ. p. 151.

*Parmelia terebrata*, Mart. Fl. Crypt. Erlang.; Tuckerm. Synops. N. E. p. 28, & Lich. Exs. n. 16.

*Lichen* dein *Parmelia diatrypa*, Ach. Syn. p. 219.

HAB. Orange Harbor, Fuegia.

7. *PARMELIA SAXATILIS*, (*Linn.*) *Ach.*

*Lichen saxatilis*, Linn. Fl. Suec. n. 1075; Sm. E. Bot. t. 603.

*Parmelia saxatilis*, Ach. Lichenogr. p. 469; Syn. p. 204; Fr. Lichenogr. p. 61; Lich. Suec. n. 168; Nyl. Prodr. p. 55.

HAB. Orange Harbor, Fuegia. Pico Ruivo, Madeira.

8. *PARMELIA BORRERI*, *Turn.*

*Parmelia Borreri*, Turn. in Linn. Trans. t. ix, p. 148, tab. 13, f. 2; Ach. Lichenogr. p. 461; Syn. p. 197; Fr. Lichenogr. p. 60; Nyl. Prodr. p. 55.

Var.  $\beta$ . *RUDECTA* (Tuckerm.): *sorediis immarginatis; thallo granulis ramulisque isidioideis obsito.*

*Parmelia rudecta*, Ach. Syn. p. 197 (var.  $\beta$ . exclusiva).

*Parmelia Borreri*  $\beta$ . *rudecta*, Tuckerm. Synops. N. E. p. 26.

HAB. Rio Janeiro, Brazil.

9. *PARMELIA CAPERATA*, (*Linn.*) *Ach.*

*Lichen caperatus*, Linn. & Auctt.; Sm. E. Bot. t. 654.

*Parmelia caperata*, Ach. Lichenogr. p. 457; Syn. p. 196; Fr. Lichenogr. p. 69; Tuckerm. Lich. Exs. n. 75; Nyl. Prodr. p. 54.

HAB. Mauna Kea, Hawaii, Sandwich Islands.

10. *PARMELIA CONSPERSA*, (*Ehrh.*) *Ach.*

*Lichen conspersus*, Ehrh. Crypt. cit. Fr.; Westr. Färglafv. t. 24.

*Parmelia conspersa*, Ach. Lichenogr. p. 486; Syn. p. 209; Fr. Lichenogr. p. 69;

Lich. Suec. n. 167; Nyl. Prodr. p. 57.

HAB. Summit of Pico Ruivo, Madeira. East Maui, and Mauna Kea, Hawaii, Sandwich Islands.

16. *PHYSCIA*, (*Fr.*) *Nyl.*1. *PHYSCIA FLAVICANS*, (*Sw.*) *DC.*

*Lichen flavicans*, Sw. Fl. Ind. Occid. 3, p. 1908.

*Parmelia flavicans*, Ach. Meth. p. 268.

*Physcia flavicans*, De Cand. Rapp. 1, 16; Fl. Fr. 4, p. 189; Nyl. Prodr. p. 59.

*Borrera flavicans*, Ach. Lichenogr. p. 504; Swartz. Lich. Amer. p. 15, tab. 11; Ach. Syn. p. 224.

*Evernia flavicans*, Fr. Lichenogr. p. 28; Montag. Cuba, l. c. p. 236.

HAB. Near Callao and Lima, Peru. Rio Janeiro, Brazil. Friendly Islands. Oahu and Hawaii, Sandwich Islands.

2. *PHYSCIA CHRYSOPHTHALMA*, (*Linn.*) *DC.*

*Lichen chrysophthalmus*, Linn. & Auctt.; Sm. E. Bot. t. 1088.

*Parmelia chrysophthalma*, Ach. Meth. p. 267; Fr. Lichenogr. p. 75; Tuckerm. Lich. Exs. n. 80.

*Physcia chrysophthalma*, De Cand. Fl. Fr. 2, p. 401; Nyl. Prodr. p. 60.

*Borrera chrysophthalma*, Ach. Lichenogr. p. 502; Syn. p. 224.

HAB. Lagunas and Valparaiso, Chili. Organ Mountains, Brazil. Bay of Islands, New Zealand.

3. *PHYSCIA PARIETINA*, (*Linn.*) *Nyl.*

*Lichen parietinus*, Linn. Fl. Suec. n. 1080; Sm. E. Bot. t. 194.

*Parmelia parietina*, Ach. Lichenogr. p. 463; Fr. Lichenogr. p. 72; Montag. Canar.

l. c. p. 110; Tuckerm. Lich. Exs. n. 79.



*Physcia parietina*, Koerb. Syst. Lich. Germ. p. 90; Nyl. Prodr. p. 60.

HAB. Madeira.

#### 4. *PHYSCIA LEUCOMELA*, (Linn.) Michx.

*Lichen leucomelas*, Linn.; Sw. Obs. Bot. tab. 11, f. 3, cit. Ach.

*Physcia leucomelas*, Michx. Fl. Amer. 2, p. 326; Nyl. Enum. l. c. p. 106.

*Parmelia leucomela*, Ach. Meth. p. 256; Fr. Lichenogr. p. 76; Montag. Canar. l. c. p. 111; Chil. l. c. p. 136.

*Borrera leucomela*, Ach. Lichenogr. p. 499; Syn. p. 222.

HAB. Obrajillo, Andes of Peru, and near Lima. Lagunas and Valparaiso, Chili (var. *latifolia*, Mey. & Flot. in Nov. Act. Nat. Cur. 19, Suppl. p. 221, tab. 3, f. 8). Hawaii. Bay of Islands, New Zealand.

#### 5. *PHYSCIA COMOSA*, (Eschw.) Nyl.

*Parmelia comosa*, Eschw. Bras. l. c. p. 119, & Ic. Sel. Crypt. tab. 13, f. 1.

*Physcia comosa*, Nyl. Enum. l. c. p. 106.

*Parmelia galactophylla*, Willd. herb.

*Parmelia ciliaris*, var. *galactophylla*, Tuckerm. Syn. Lich. N. E. p. 32.

*Parmelia speciosa*, var. *galactophylla*, Tuck. Lich. Exs. n. 82.

HAB. Rio Janeiro.—Probably what Hoffmann refers to (Fl. Germ. 2, p. 144, his specimens being from Muhlenberg) as a variety of *P. ciliaris*. And this appears, from his herbarium, to have been Floerke's opinion of the Lichen from Pennsylvania. But I possess specimens which seem to connect the plant very closely with *P. speciosa*.

#### 6. *PHYSCIA APPLANATA*, (Fée) Nyl.

*Parmelia applanata*, Fée, Cryptog. p. 126, tab. 32, f. 2; Montag. Cuba, l. c. p. 223, tab. 8, f. 1.

*Physcia applanata*, Nyl. Enum. Gen. l. c. p. 107.

HAB. Twigs of trees, Carlshoff Island, Paumotu Group. A fragment, and infertile, but with the peculiar habit of this species. According to Dr. Montagne, the Lichen described by Prof. Fée, and himself, should be referred to *Parmelia picta* (Sw.) Ach. (Montag. Syll. pp. 328-9.)

17. UMBILICARIA, *Hoffm.*UMBILICARIA VELLEA, (*Linn.*) *Fr.*

*Lichen velleus*, Linn. ex. auct. Ach. Lichenogr. p. 228, & Fr. infra.

*Umbilicaria vellea*, Fr. Lichenogr. p. 357; Nyl. Prodr. p. 65.

HAB. Region of *Sophora*, on Mauna Loa, Hawaii. The specimen infertile, and the determination therefore uncertain.

18. PYXINE, *Fr.*PYXINE COCOES, (*Ach.*) *Nyl.*

*Lichen Cocoes*, Sw. Fl. Ind. Occid. 3, p. 1891.

*Lecidea Cocoes*, Ach. Lichenogr. p. 216; Swartz, Lich. Amer. p. 2, tab. 2.

*Pyxine Cocoes*, Nyl. Enum. Gen. l. c. p. 108.

HAB. Twigs of trees, Carlshoff Island, Paumotu Group. Infertile, but appears to belong to this species, which Mr. Wright has sent to me in fine condition, from Cocoa palms in the Island of Cuba.

19. PANNARIA, *Delis.*, *Nyl.*1. PANNARIA PANNOSA, (*Sw.*) *Delis.*

*Lichen pannosus*, Swartz. Fl. Ind. Occid. 3, p. 1888.

*Lecidea pannosa*, Ach. Meth. p. 84.

*Parmelia pannosa*, Ach. Lichenogr. p. 465; Swartz Lich. Amer. p. 6, tab. 5.

*Pannaria pannosa*, Delis. in Dict. Class. cit. Duby; Nyl. Enum. l. c. p. 109.

HAB. Mountains of Tahiti. Paumotu Islands. Feejee Islands.

2. PANNARIA RUBIGINOSA, (*Thunb.*), *Delis.*

*Lichen rubiginosus*, Thunb. Prodr. Fl. Cap. p. 176; Wahl. Lapp. p. 424.

*Parmelia rubiginosa*, Ach. Lichenogr. p. 467; Syn. p. 202; Fr. Lichenogr. p. 88; Lich. Suec. n. 107.

*Pannaria rubiginosa*, Delis. l. c.; Duby Bot. Gall. 2, p. 606; Nyl. Prodr. p. 66.

HAB. Summit of Pico Ruivo, Madeira. Mountains of Tahiti. Hawaii, Sandwich Islands.

## 20. SQUAMARIA, DC., Nyl.

## 1. SQUAMARIA CHRYSOLEUCA var. DALTONI, Tayl. (Tab. 1. fig. 4.)

*Squamaria chrysoleuca* var. *Daltoni*, Tayl. in Hook. f. Fl. Antarct. 2, p. 534, tab. 198.

HAB. Snow line of the Andes of Chili, behind Santiago.—The figure presents the habit of the Lichen, which, since this report was first prepared, has been illustrated in the cited Antarctic Flora of Dr. Hooker.

## 21. PLACODIUM, DC., Nyl.

## 1. PLACODIUM PAUMOTENSE, Sp. Nov.

*P. thallo subcartilagineo adnato e glauco albicante subtiliter pruinoso, laciniis linearibus multifidis irregulariter imbricatis concretescentibusque planiusculis nunc sorediatis vel omnino granulatis apicibus rotundatis crenatis; hypothallo nigro; apotheciis sessilibus margine thallode vel tumidulo prius inflexo discum vix demum æquante crenulato, vel excluso discum e plano convexiusculum opacum rufo-nigrum margine proprio valido nitidulo cinctum fulcidente.*

HAB. Carlshoff Island, Paumotu Group.

Thallus somewhat cartilagineous, adnate, glaucous-white, very delicately pruinose; lobes irregularly imbricated, here and there growing together, linear, multifid, flattish, more or less besprinkled with soredia, or altogether granulate. Hypothallus black. Apothecia sessile, with a tumid, at length crenulate, thalline margin, which is finally excluded, and the slightly convex, opaque, rufous-blackish disk is bordered only by its strong proper margin. The specimen which afforded this diagnosis, in 1846, has since been lost from the collections of the government, and I cannot, therefore, add anything to the above.

## 2. PLACODIUM MURORUM, (Hoffm.) DC.

*Lichen murorum*, Hoffm. Enum. p. 63, 9, f. 2.

*Parmelia murorum*, Ach. Meth. p. 195; Fr. Lichenogr. p. 115; Lich. Suec. n. 391.

*Placodium murorum*, De Cand. Fl. Fr. 2, p. 378; Nyl. Prodr. p. 73.

*Lecanora murorum*, Ach. Lichenogr. p. 433; Syn. p. 181.

HAB. California.

22. LECANORA, *Ach.*, *Nyl.*1. LECANORA AURANTIACA, (*Lightf.*) *Nyl.*

*Lichen aurantiacus*, *Lightf.* Fl. Scot. 2, p. 810.

*Lecidea aurantiaca*, *Ach.* Lichenogr. p. 204; *Syn.* p. 50.

*Biatora aurantiaca*, *Fr.* Lich. Suec. n. 41; *Tuckerm.* *Syn.* p. 63.

*Parmelia* (*Patellaria*) *aurantiaca*, *Fr.* Lichenogr. p. 165.

*Lecanora aurantiaca*, *Nyl.* Prodr. p. 76.

HAB. Twigs, with *L. subfusca*, Tahiti, Society Islands.

2. LECANORA PALLESCENS, (*Linn.*) *Fr.*

*Lichen pallescens*, *Linn.* Fl. Suec. n. 944, & *Auctt.* e *Fr.* infra.

*Lecanora pallescens*, *Fr.* Lich. Suec. n. 103.

*Parmelia pallescens*, *Fr.* Lichenogr. p. 132; *Tuckerm.* Lich. Amer. n. 90.

*Lecanora Parella*,  $\beta$ . *pallescens*, *Ach.* p. 370; *Syn.* p. 169; *Nyl.* Prodr. p. 84.

HAB. Port Discovery, Puget Sound, Oregon. A morbid state.

Var.  $\beta$ , PARELLA, *Fr.*

*Lichen Parellus*, *L.* Mant. p. 132; *Sm.* E. Bot. t. 727.

*Patellaria Parella*, *Hoffm.* Pl. Lich. tab. 12, f. 5.

*Lecanora Parella*, *Ach.* Lichenogr. p. 370; *Syn.* p. 169.

*Parmelia* (*Patellaria*) *pallescens*,  $\beta$ , *Fr.* Lichenogr. p. 133.

HAB. Orange Harbor, Fuegia.

3. LECANORA SUBFUSCA, *Linn.*, *Ach.*

*Lichen subfuscus*, *Linn.* Fl. Suec. n. 1072, e *Wahl.* Fl. Lapp. p. 407.

*Parmelia subfusca*, *Ach.* Meth. p. 167; *Fr.* Lichenogr. p. 136; *Eschw.* Bras. l. c. p. 181; *Montag.* Canar. l. c. p. 115.

*Lecanora subfusca*, *Ach.* Lichenogr. p. 393; *Syn.* p. 157; *Nyl.* Prodr. p. 85.

HAB. Tahiti. Carlshoff Island, Paumotu Group. All the specimens are referable to the var. *distans*, *Fr.*

4. LECANORA ATRA, (*Huds.*) *Ach.*

*Lichen ater*, *Hudson* Fl. Ang. p. 530; *Sm.* E. Bot. t. 949.

*Parmelia atra*, Ach. Meth. p. 154; Fr. Lichenogr. p. 141; Lich. Suec. n. 203, 370; Montag. Cuba, l. c. p. 207.

*Lecanora atra*, Ach. Lichenogr. p. 344; Syn. p. 146; Nyl. Prodr. p. 90.

HAB. On trees, Carlshoff Island, Paumotu Group. This possesses the spores of *L. atra* and *L. subfusca*, and differs from the latter, just as *L. atra* does, in the disk being black within. The Lichen is perhaps finer than ordinary states of *L. atra*, upon trunks; the margins of the apothecia being more constantly and regularly crenulate, and the disk quite commonly bespread with a delicate greenish bloom.

### 23. THELOTREMA, Ach.

THELOTREMA LEPADINUM, Ach.

*Lichen lepadinus*, Ach. Prodr. p. 30.

*Thelotrema lepadinum*, Ach. Meth. p. 132; Lichenogr. p. 312; Syn. p. 115; Fr. Lichenogr. p. 428; Lich. Suec. n. 38; Turn. & Borr. Lich. Brit. p. 180; Nyl. Prodr. p. 100.

HAB. Oregon.

### 24. CÆNOGONIUM, Ehrenb.

CÆNOGONIUM LINKII, Ehrenb.

*Cænogonium Linkii*, Ehrenb. in Hor. Phys. Berol. p. 120, t. 27; Fée Cryptog. p. 138, tab. 2, f. 27; Montag. Cuba, l. c. p. 108; Ejusd. Chili, l. c. p. 211; Nyl. Enum. Gen. l. c. p. 119.

HAB. Organ Mountains, Brazil. This plant has been removed to the *Lecidinei* by Dr. Nylander, and, it appears to me, with sufficient reason.

### 25. GRAPHIS, Ach.

GRAPHIS SCRIPTA, (Linn.) Ach.

*Lichen scriptus*, L. Fl. Suec. n. 1057, & Auctt.

*Opegrapha scripta*, Ach. Meth. p. 30; Fr. Lichenogr. p. 370.

*Graphis scripta*, Ach. Lichenogr. p. 265; Syn. p. 81; Nyl. Prodr. p. 149.

HAB. Tahiti, Society Islands.

# INDEX.

SYNONYMES, AND THE NAMES OF GENERA AND SPECIES INCIDENTALLY MENTIONED, ARE IN ITALIC.

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A L G Æ.

BY

JACOB WHITMAN BAILEY

AND

WILLIAM HENRY HARVEY.



## A L G Æ.

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THE recent publication of several large Algological works, has rendered it unnecessary to include, in this Report, any remarks upon the present state of the science, or upon the classification of Algæ. For information upon these points, as well as for the Synonyms of many of the species, we would refer to the *Species, Genera, et Ordines Algarum*, by J. G. Agardh; the *Phycologia* of Kützinger; and the *Phycologia Britannica*, the *Nereis Australis*, and the *Nereis Boreali-Americana*, of Professor Harvey.

Our Report is wholly founded upon an examination of the dried specimens of the present collection, which were unaccompanied by any notes, except the indication of the locality where each specimen was gathered. The following list exhibits the species found at each locality, and includes the characters of the new genera and species. This is followed by a similar list of the Diatomaceæ, and other microscopic objects found adhering to the Algæ.

### NEW SOUTH WALES.

PHYLLOSPORA COMOSA, *Agardh*; *J. Ag. Sp.* 1, p. 253.

CYSTOPHYLLUM MURICATUM, *J. Ag. Sp.* 1, p. 231.

CYSTOPHORA MONILIFERA, *J. Ag. l. c. p.* 241.

HORMOSPORA SIEBERI, *Bory*; *J. Ag. l. c. p.* 199.

ECKLONIA RADIATA, *J. Ag. l. c. p.* 146.

*PLOCAMUM AUGUSTUM*, *Hook. & Harv. ; Harv. Ner. Austr. p. 122.*

*LAURENCIA CÆSPITOSA*, *Lamour. ; Harv. Ner. Austr. p. 82.*

#### NEW ZEALAND.

*SPLACHINDIUM RUGOSUM*, *Grev. ; J. Agardh, Sp. p. 186.*

*HORMOSIRA BILLARDIERI*, *J. Ag. l. c. p. 199.*

*CYSTOPHORA RETORTA*, *J. Ag. l. c. p. 243.*

*CYSTOPHORA MONILIFERA*, *J. Ag. l. c. p. 241.*

*FUCODIUM GLADIATUS*, *J. Ag. l. c. p. 202.*

*DURVILLÆA UTILIS*, *Bory ; J. Ag. l. c. p. 188.*

*CARPOPHYLLUM MASCHALOCARPUM*, *Grev. ; J. Ag. l. c. p. 300.*

*SARGASSUM PLUMOSUM*, *Rich. ; J. Ag. l. c. p. 188.*

*SARGASSUM SINCLAIRII*, *Hook. & Harv. (Tab. 1.)*

A single, imperfect specimen, gathered in the Bay of Islands, occurs in this collection ; which is in some measure doubtful, as it is without the fruit or base of the stem. It is about a line in diameter below, and tapers upward to less than half that size ; and is undivided and obtusely triangulate, or semiterete below. The lateral branches are reflexed at their insertion, alternate, one or two inches asunder, simple or pinnately decomposed, bare of leaves in their lower half, but rough with the spine-like petioles of old leaves ; leafy above. *Leaves* from an inch to one and a half inches long, three to four lines wide, very unequal-sided at the base, and there attenuated and cuneate, obtuse at the apex, oblongo-lanceolate, unequally toothed, or sub-entire. *Vesicles* numerous, especially on the naked part of the branches, elliptical, on short, terete petioles, mucronate, or tipped with a leaf. We refer this specimen, with some hesitation, to *S. Sinclairii*, *Hook. & Harv.*, a little understood species, of which no very complete specimens have yet reached us. It agrees with those collected by Dr. Sinclair, in many points, but wants the large incised lower leaves ; and we regard it as an older condition of the plant from which the lower leaves have disappeared.

## N O T H E I A, Nov. Gen. Fucoidearum.

*Frons parasitica, filiformis, prolifera, solida. Scaphidia per totam frondem sparsa, in strato corticali infra superficiem excavata, sphaerica, cum ostioli superficiali per canalem communicantia. Sporæ intra perisporium hyalinum lineari-obovatum parietale nidulantes. Paranemata simplicia. Alga parasitica, pusilla, organis nullis discretis, quasi receptaculis Cystoseiræ vel Sargassi habitu referens.*

NOTHEIA ANOMALA, Harv. & Bail. (Tab. 9, f. 3-6.)

HAB. Bay of Islands; parasitic on *Hormosira Sieberi*.

Frond two or three inches high, twice as thick as hog's bristles, filiform, slightly tapering at the base and apex, undivided, furnished with lateral branches, which are similar to the primary frond, and which arise from all sides proliferously; each young branch springing from one of the scaphidia of an older branch. Branches and ramuli successively smaller, the youngest fusiform and mostly arched. Scaphidia dispersed through all parts of the frond, immersed in the cortical layer, spherical, with a rather large aperture. Spores in very narrow, almost linear, slightly obovate, almost parietal perispores, which are guarded by numerous simple paranemata. Color olivaceous; substance subcoriaceous.

This very curious production, if it be a separate organism, and not some strange metamorphosis of the *Hormosira* upon which it grows, must constitute a new genus, allied to *Splachnidium*, from which it is distinguished, both by habit and by the solid structure of its frond. It strikingly resembles the receptacles of the fruit of a *Cystoseira* or *Sargassum*, if we can conceive these to grow, without a frond, directly from the internodes of a *Hormosira*. The plant forms a little bush; but each branch rises, as it were, viviparously from the scaphidium of a previous branch. We have not tested its connection with the *Hormosira*, nor ascertained whether it springs from a scaphidium of that plant. Should this be the case, it is not impossible that our *Nothetia* may be nothing but a *spurious* production, after all.

[Since the above was written, copious specimens have been received, from various collectors in New Zealand and Australia; and Dr. Harvey

has himself collected this curious parasite in many localities on the south coast of Australia, and in Tasmania. He is now satisfied that it is really a parasitic Alga, and not a metamorphic state of *Hormosira*. A figure is given in Hooker's Flora of New Zealand, tab. 109.

W. H. H.]

ECKLONIA RICHARDIANA, *J. Ag. Sp.* 1, p. 147.

LESSONIA FUSCESCENS, *J. Ag. l. c.* p. 151.

SCYTHAMNUS AUSTRALIS, *Hook. & Harv. ; J. Ag. l. c.* p. 64.

ZONARIA FLAVA, *Ag. ; J. Ag. l. c.* p. 110.

SPHACELARIA PANICULATA, *Suhr. ; J. Ag. l. c.* p. 36.

EPINEURON COLENSOI, *Harv. Ner. Austr.* p. 26, p. 10.

POLYZONIA HARVEYANA, *Décaisne ; Harv. l. c.* p. 72.

LAURENCIA OBTUSA, *Lamour. ; J. Ag. Sp.* 2, p. 750.

LAURENCIA VIRGATA, *J. Ag. l. c.* p. 752.

CLADHYMENIA OBLONGIFOLIA, *Harv. in Hook. Fl. N. Zeal.* t. 113.

PLOCAMIMUM ABNORME, *Hook. & Harv. in Lond. Jour. Bot.* 4, p. 543 ;  
*Harv. Ner. Austr.* t. 43.

RHODYMENIA DICHOTOMA, *Hook. & Harv. Fl. Antarc.* 1, p. 186, t. 72.

GRACILARIA CORIACEA, *Hook. & Harv. Fl. N. Zeal.* 2, p. 43.

MELANTHALIA JAUBERTIANA, *Mont. ; J. Ag. Sp.* 2, p. 613.

GELIDIUM CORNEUM, *Lamour. ; Harv. Phyc. Brit.* t. 53.

PTEROCLADIA LUCIDA, *J. Ag. l. c.* p. 483.

GIGARTINA LIVIDA, *Grev. (Chondroelonium, Kütz.)*

GIGARTINA ALVEATA, *J. Ag. l. c.* p. 271. (*Mastocarpus, Kütz.*)

GIGARTINA (MASTOCARPUS) RADULA, *J. Ag. l. c.*

IRIDÆA MICANS, *Bory ; Kütz. Phyc.* p. 726.

IRIDÆA LUSORIA, *Harv. (Tab.* 3.)

*I. fronde stipitata coriaceo-cartilaginea crassa, siccitate cornea, simplici vel dichotome fissa, segmentis lineari-cuneatis basi attenuatis apice sæpe furcatis nunc margine integerimis nunc laciniatis pinnatifidisve nunc margine proliferis.*

*Rhodymenia? lusoria*, Grev. ! in Hook. Comp. Bot. Mag. 2, p. 329.

HAB. Bay of Islands ; first found by Richard Cunningham.

Fronds 6 to 18 inches long, from a slender stipe, which is from one to three inches in length, a line or two in diameter, cylindrical for an inch or more from its base, and then gradually flattening and expanding into an irregular frond, which is cuneate at the base, and divided above into numerous segments. Segments linear, attenuate at the base, often as much as half an inch wide in the middle ; thence attenuate to the apex, which is often furcate ; in many cases, irregularly subdivided, and bearing on their margins other segments in a pinnate or proliferous manner. Color dull purple. Structure that of *Iridæa*. Cruciate spores are abundant in the surface-cells.

CALOPHYLLIS DISCIGERA, Kütz. *Phyc. p.* 745.

KALLYMENIA WILKESII, *Harv. & Bail.*

Fragments of a seemingly new species, with the structure attributed by Kützing to his genus *Sarcophyllis*.

#### A P O P H L Œ A, *Harv.* (Tab. 2, f. 1.)

*Frons carnosocartilaginea, crustacea, adnata, ramos breves mamillæformes e disco emittens. Structura e filis tenuissimis excentricis densissimis reticulatim connexis constituta. Conceptacula numerosa, spherica, tetrasporas parietales zonatim partitas paranematibus suffultas foventia.—Alga littorea, rupestris, intense rubra, ramis uncialibus crassissimis pluries dichotomis fastigiatis.*

APOPHLŒA SINCLARII, *Harv. in Lond. Jour. Bot.* 4, p. 549, & *Hook.*

*Fl. N. Zeal.* 2, p. 244, t. 116.

CLADOPHORA HERPESTICA, Kütz. (*Conferva, Mont.*)

CODIUM TOMENTOSUM, *Ag.*

CAULERPA SEDOIDES, *Lamour.* (*Chauvinia, Kütz.*)

ENTEROMORPHIA INTESTINALIS, *Ag.*



## CAPE HORN AND TERRA DEL FUEGO.

DURVILLÆA UTILIS, *Bory ; J. Ag. Sp.* 1, p. 188.

LESSONIA NIGRESCENS, *Bory ; J. Ag. l. c.*

MACROCYSTIS PYRIFERA, var. *J. Ag. l. c. p.* 156.

DESMARESTIA ROSSII, *Hook. & Harv. Fl. Antarc. t.* 172, 173.

PTILONIA MAGELLANICA, *J. Ag. sp.* 2, p. 774.

ACANTHOCARPUS ANTARCTICUS, *Hook. & Harv. Fl. Antarc. t.* 181.

CALLOPHYLLIS VARIEGATA, *Kütz. l. c. p.* 745.

GYMNOGONGRUS PLICATUS, *Kütz. l. c. p.* 789.

GIGARTINA (MASTOCARPUS) RADULA, *Kütz. l. c. p.* 733.

CODIUM TOMENTOSUM, *Ag. ; Kütz. l. c. p.* 500.

ENTEROMORPHA COMPRESSA, *Kütz. l. c. p.* 480.

BALLIA BRUNONIS, *Harv. (B. callitricha, & B. Hombroniana, Kütz. l. c. p.* 663).

## NORTHWEST AMERICA, CHIEFLY PUGET SOUND.

FUCUS VESICULOSUS, *Linn. ; J. Ag. Sp.* 1, p. 210.

FUCUS FASTIGIATUS, *J. Ag. l. c. p.* 203.

PHYLLOSPORA MENZIESII, *J. Ag. l. c. p.* 254.

MACROCYSTIS PYRIFERA, *Ag. ; J. Ag. l. c. p.* 156.

COSTARIA MERTENSII, *J. Ag. l. c. p.* 140.

DESMARESTIA ACULEATA, *Lamour. ; J. Ag. l. c. p.* 167.

RHODOMELA LARIX, *Ag. (Lophuria, Kütz.).*

DASYA (STICHOCARPUS) PLUMOSA, *Harv. & Bail.*

*D. fronde inarticulata compressa ancipiti bi-tripinnata, pinnis elongatis pinnulisque brevibus alternis, ramellis monosiphoniis distichis crebris sæpius oppositis strictis simplicibus vel furcatis, axillis angustis, articulis ramellorum cylindricis diametro triplo longioribus.*

HAB. Puget Sound.

A single imperfect specimen of this plant is in the collection. The above-mentioned characters sufficiently distinguish it from any other member of the genus. In habit it resembles a *Ptilota*; but the cross-section of the stem shows the structure of *Dasya*. The frond is several inches long, ovate in outline, twice or thrice pinnate; the pinnæ alternate and elongated; the pinnules short. Both pinnæ and pinnules are beset throughout with short, distichous, opposite, jointed ramelli. The branches are strongly compressed and somewhat two-edged, quite opaque, and coated with small cells. Color, a clear carmine.

BOTRYOCARPUM PLATYCARPUM, *Kütz.*; *Harv. Ner. Bor. Am.* 2, p. 100.

HYMENENA FISSA, *Grev.*; *Harv. l. c.* p. 101.

HYMENENA FIMBRIATA, *Post. & Ruppr.*; *Harv. l. c.* p. 102.

PLOCAMIUM COCCINEUM, *Lyngb.*; *Harv. l. c.* p. 153.

RHODYMENIA WILKESII, *Harv. & Bail.* (Tab. 4.)

*R. stipite brevi cartilaginea compressa mox cuneato-plana et in laminam 1-3-pedalem lato-lanceolatam subindivisam membranaceam sanguineo-rubescens explanata; coccidiis numerosissimis per frondem densissime sparsis.\**

HAB. Straits of San Juan de Fuca.

Root scutate. Fronds tufted, rising with a compressed cartilaginous stem; which, at about half an inch to an inch in height, becomes flattened, cuneate, and gradually widens out and is lost in the base of a broadly lanceolate lamina, from one to three feet in length, and from 4 to 8 or 10 inches in breadth. Lamina obovate-lanceolate, much attenuated at the base, entire? or sometimes forked, commonly quite simple, of a pale, sanguineous red, fading to greenish; the newer portion formed, as in the *Laminariæ*, between the apex of the cartilaginous stem, and the base of the expanded portion of the frond. Coccidia about as large as poppy-seed, spherical, extremely numerous, imbedded in the lamina, and scattered thickly through three-fourths of it, commencing near the apex, and gradually extending towards the base.

\* For the reasons given in the *Nereis Boreali-Americana*, 2, p. 147, the name of this species must be changed to *Rhodymenia pertusa*, *J. Ag. Sp. Alg.* 2, p. 376. W. H. H.

A very fine species, quite unlike any of the genus hitherto described. It has the habit of an *Iridæa*, the abundant scattered fruit of a *Kalymenia*, and the essential structure of a *Rhodymenia*.

CALOPHYLLIS LACINIATA, *Kütz. l. c.*; *Harv. Ner. Bor. Am.* 2, p. 171.

RHABDONIA COULTERI, *Harv. Ner. Bor. Am.* 2, p. 154, t. 23.

*R. radice fibrosa; caule erecto basi attenuato sursum incrassato simplici ramos alternos emittente; ramis incrassatis basi attenuatis vermicularibus nunc nudis nunc alterne ramulosis patentibus; coccidiis conicis numerosis per ramos sparsis.*

HAB. Puget Sound. (Monterey, California, Coulter.)

Fronds rising from a mass of fibres, 6 to 8 inches long, much attenuated below, gradually thickened upwards, and at length more than a line in diameter above, shrinking much in drying, undivided, naked below, furnished with alternate or secund branches above, from an eighth to a fourth, or even half an inch apart. Branches from one to three or four inches in length, tapering at the base, and thickened upwards, obtuse and worm-like, or acute, naked, or with a few secondary alternate branches, similar to the primary ones. Coccidia abundant on the branches, prominent, conical. Structure dense; the axis composed of numerous filaments. Color a dark-purplish red. Substance cartilaginous, shrinking much in drying.—Description chiefly from Coulter's specimens, which are more perfect than those brought home by the Expedition.

AMPHIROA CALIFORNICA, *Decaisne*; *Harv. Ner. Bor. Am.* 2, p. 86.

HALOSACCION HYDROPHORA, *J. Ag. sp.* 2, p. 358; *Post. & Ruppr. Fl.* t. 25.

CORALLINA OFFICINALIS, *Ellis & Soland.*; *Harv. Ner. Bor. Am.* l. c.

PRIONITES LANCEOLATA, *Harv. l. c.* 2, p. 197, t. 27.

GIGARTINA (MASTOCARPUS) RADULA, *Kütz.*; *Harv. l. c.*

GIGARTINA (MASTOCARPUS) CORYMBIFERA, *Kütz.* (G. Radula, var.)

GIGARTINA (METROCARPUS) EXASPERATA, *Harv. & Bail.* (Tab. 5.)

*G. fronde stipite mox in laminam coriaceo-membranaceam bi-tripedalem lato-lanceolatam integram dilatata, margine incrassato eroso-dentato et*

*appendiculato, disco utrinque spinulis simplicibus ramosisve dense consperso; coccidiis pedicellatis in spinulis marginalibus et e disco ortis immersis.*

HAB. Puget Sound, opposite Fort Nisqually.

Frond 2 or 3 feet long, 6 to 10 inches wide, rising with a short stem; which soon dilates into a single lanceolate lamina, jagged, and irregularly dentate at the margin, and roughened all over both surfaces with short spinules, which are either simple or forked. Substance thin (much thinner than that of *G. Radula*), but leathery when dry. Color a fine purple. Fruit pedicellate, borne toward the base of the frond, in the marginal or discal spines.

GIGARTINA MOLLIS, *Harv. & Bail.* (Tab. 6, f. 3, 4.)

*G. fronde cartilaginea plano-compressa lineari disticha pinnatim ramosa purpurea, ramis ramulisque alternis vel oppositis erectis basi angulatis attenuatis integris vel denticulatis apice pinnatis, ramulis ultimis angustis subfiliformibus.*

HAB. Puget Sound.

Frond 3 or 4 inches high, a line or a line and a half wide, distichously branched, from once to thrice pinnated; the pinnæ (and pinules) all very erect, naked below, closely set with pinnules above, narrowed toward the base and apex, sometimes forked, and then each division pinnulated. Color purple. Substance cartilaginous, soon decomposing, if moistened after having been once dried, and then closely adherent to paper.

IRIDÆA MERTENSIANA, *Post. & Ruppr. Fl. t. 23.*

PTILOTA ASPLENIODES, *J. Ag. Sp. 2, p. 98; Post. & Ruppr. l. c. t. 29.*

PTILOTA PLUMOSA, *J. Ag. l. c. Harv. Phyc. Brit. t. 80.*

CERAMIUM RUBRUM, *Ag.; Harv. Ner. Bor. Am. l. c.*

PORPHYRA VULGARIS, var. *Harv. Ner. Bor. Am l. c.*

ULVA LATISSIMA, *Linn.; Harv. l. c.*

ENTEROMORPHA COMPRESSA, *Grev.; Kütz. l. c. p. 480.*

NOSTOC EXPANSUM, *Harv. & Bail.* (Tab. 6, f. 1, 2.)

*N. terrestre* ; thallo expanso irregulariter lobato prasino, filis periphericis arctissime intricatis densissimis, centralibus laxè imbricatis dilute æruginosis, cellulis sphaericis vel ellipsoideis ; spermatis sphaericis.

HAB. Puget Sound.

Frond 8 inches long and 4 inches broad, perhaps formed by the confluence of numerous individuals, very firm and leathery, uniformly about as thick as a wafer, composed of jointed moniliform filaments, which are very closely packed near the exterior surface, but loosely scattered in a firm jelly in the interior. The articulations of the filaments are generally small, spherical or slightly elliptical, but occasionally larger and of a globular shape.

A single specimen of this beautiful plant was collected near Puget Sound. The earth adhering to it, containing many fluviatile *Diatomaceæ*, indicates that the plant grew in a place permanently wet with fresh water.

#### VALPARAISO, CHILI.

DURVILLÆA UTILIS, *Bory* ; *J. Ag. Sp.* 1, p. 187.

SARGASSUM CYMOSUM, *Ag.* ; *J. Ag. l. c.* p. 341.

MACROCYSTIS PYRIFERA, *Ag.* ; *J. Ag. l. c.* p. 156.

LESSONIA NIGRESCENS, *Bory* ; *J. Ag. l. c.* p. 151.

LAURENCIA VIRGATA, *J. Ag. Sp.* 2, p. 752.

RHODYMENIA CORALLINA, *Grev.* ; *Kütz. l. c.* p. 780.

CALLOPHYLLIS VARIEGATA, *Kütz. l. c.* ; *J. Ag. l. c.* p. 302.

HYPNÆA MUSCIFORMIS, *Lamour.* ; *Kütz. l. c.* p. 758.

GYMNOGONGRUS VERMICULARIS, *J. Ag.* (Tab. 6, f. 5, 6.)

*G. fronde compressa (siccitate fere plana) lineari-angusta repetite dichotoma fastigiata, axillis obtusis, apicibus obtusis furcatisve ; coccidiis frequentibus in ramis minoribus semi-immersis parvis.*

FUCUS VERMICULARIS, *Turn. Brit. Fuc. t.* 221.

GRACILARIA CONCINNA, *Sond. in Herb. T. C. D.*

Frond 2 or 3 inches high, from half a line to nearly a line in breadth, compressed or nearly flat when dry, corrugated longitudinally from shrinking, repeatedly and regularly dichotomous, with wide axils and very obtuse and bifid apices; the branches fastigate. Substance cartilaginous, rigid when dry. Color a dull greenish-purple, darker toward the tips. Coccidia small, half sunk in the ramuli.

GRATELOUPIA CUTLERIÆ, *Binder; J. Ag. Sp. 1, p. 183.*

IRIDÆA LAMINARIOIDES, *Bory; Kütz. l. c. p. 726.*

CHONDRUS EXILIS, *Harv. & Bail. (Tab. 6, fig. 1, 2.)*

*C. pusillus; fronde unciali complanata anguste lineari crebre dichotoma, axillis patentibus rotundatis, segmentis linearibus apicibusque obtusis.*

Root scutate. Frond scarcely an inch high, from a quarter to half a line in breadth, flat, linear, closely and repeatedly dichotomous, with rounded axils and patent linear segments; the apices truncate or very obtuse, sometimes retuse. Substance cartilagineo-corneous, rigid when dry. Color, a dull brownish-red.

GYMNOGONGRUS DENDROIDES, *Harv. & Bail. Vide infra, p. 169.*

CENTROCERAS CLAVULATUM, *J. Ag. Sp. 2, p. 148.*

CONFERVA ÆREA, *Dillw. Conf.; Harv. Phyc. Brit. t. 99.*

CODIUM ADHÆRENS, *Ag.; Harv. l. c. t. 35.*

ULVA LINZA, *Linn.; Harv. l. c. t. 39.*

ULVA LATISSIMA, *Linn.; Harv. l. c. t. 171.*

#### RIO DE JANEIRO.

SARGASSUM VULGARE, *Ag.; J. Ag. Sp. 1, p. 342.*

SARGASSUM CYMOSUM, *Ag.? (Sterile).*

PADINA PAVONIA, *Adans.; J. Ag. l. c. p. 113.*

DICTYOTA BARTAYRESIANA, *Lamour.; J. Ag. l. c. 1, p. 94.*

CODIUM TOMENTOSUM, *Ag.; Harv. Phyc. Brit. t. 93.*

CAULERPA CLAVIFERA, *Ag.*; *Kütz. l. c.*

ULVA LATISSIMA, *Linn.*; *Harv. l. c. t. 171.*

ENTEROMORPHA COMPRESSA, *Grev.*; *Harv. l. c. t. 335.*

#### NORTH ATLANTIC OCEAN.

SARGASSUM VULGARE, *Ag.*; *J. Ag. Sp. 1, p. 342.*

SARGASSUM BACCIFERUM, *Ag.*; *J. Ag. l. c.*

#### CAPE DE VERDE ISLANDS.

CHNOOSPORA FASTIGIATA, var. ATLANTICA, *J. Ag. Sp. 1, p. 172.*

ECTOCARPUS HAMULOSUS, *Harv. & Bail. (Tab. 7, fig. 3-5.)*

*E. caespite brevi densissime implicato, filis implexis curvatis vage ramosis, ramis horizontalibus refractisque secundis vel alternis, ramulis hamatis simplicibus vel furcatis patentissimis sparsis, articulis diametro duplo triplove longioribus; sporis sphaericis vel ovalibus ramulos terminantibus (i. e. pedicellatis).*

Tufts scarcely an inch high, very dense. Filaments matted together, irregularly branched; the branches spreading at right angles or reflexed, very unequal in length, secund or alternate, producing a few scattered, short, hooked ramuli, some of which are simple, some forked, and some yet more divided. Articulations twice or thrice as long as broad, with brown endochrome. Spores terminating the ramuli, either globose or oval. A very curious and well-characterized species.

LAURENCIA CAESPITOSA, *Lamour.*; *Harv. Phyc. Brit. p. 286.*

HYPNÆA MUSCIFORMIS, *Lamour.*; *Kütz. l. c. p. 758.*

GELIDIUM CORNEUM, *Lamour.*; *Kütz. l. c. p. 764.*

CHONDRUS UNCIALIS, *Harv. & Bail. (Tab. 7, fig. 67.)*

*C. fronde unciali stipitata sursum flabelliformi angustissima plano-compressa multoties dichotoma fastigiata, axillis patentibus, apicibus bifidis.*

Frond stipitate. Stipe half the length of the frond, simple, flattened, ending in a repeatedly dichotomous lamina; segments as narrow as

the stipe, a quarter of a line wide, flattened, linear, fastigiate, with patent axils. Color, a dull purple-red.

A minute species, much smaller than any form of *C. crispus*, more nearly allied to our *C. exilis*, but differing in being distinctly stipitate.

CAULERPA CLAVIFERA, *Ag.*; *Kütz. l. c. p.* 498.

CLADOPHORA FASCICULARIS, *Mert.*; *Kütz. l. c. p.* 393.

CONFERVA MEDIA, *Ag. Syst. p.* 100.

ULVA LATISSIMA, *Ag. l. c.*

#### MADEIRA.

CYSTOSEIRA CONCATENATA, *J. Ag. Sp. 1, p.* 218 ?.

PADINA PAVONIA, *Linn.*; *J. Ag. l. c. p.* 113.

ZONARIA LOBATA, *Ag.*; *J. Ag. l. c. p.* 109 ?.

DICTYOTA DICHOTOMA, *J. Ag. l. c. p.* 92.

SPHACELARIA SCOPARIA, *J. Ag. l. c. p.* 36.

GELIDIUM CORNEUM, *Lamour.*; *Kütz. l. c. p.* 764.

CENTROCERAS CLAVULATUM, *J. Ag. l. c. 2, p.* 148.

CODIUM TOMENTOSUM, *Ag.*; *Kütz. l. c. p.* 500.

ULVA LATISSIMA, *Linn.*; *Harv. Phyc. Brit. t.* 171.

LICHINA PYGMÆA, *Ag.* (Now referred to Lichenes.)

#### PACIFIC ISLANDS.

TURBINARIA VULGARIS, *J. Ag. Sp. 1, p.* 267. Tongatabu.

TURBINARIA ORNATA, *J. Ag. l. c.* Sandwich, Society, Wake, and Feejee Islands.

SARGASSUM ECHINOCARPUM, *J. Ag. l. c. p.* 266. Sandwich Islands.

SARGASSUM CYMOSUM, *Ag.* Sandwich Islands.

SARGASSUM VULGARE, *Ag.* Pacific Islands.

SARGASSUM POLYCISTUM, *Ag.* Tongatabu, Feejee Islands.



SARGASSUM POLYPHYLLUM, *J. Ag. l. c.* Sandwich Islands.

SARGASSUM PARVIFOLIUM, *Ag.* Tongatabu.

CHNOOSPORA PANNOSA, *J. Ag.* Eimeo, Society Islands.

DICTYOTA ACUTILOBA, *J. Ag.* Sandwich Islands.

DICTYOTA BIDENTATA, *Harv. & Bail.* (Vide infra, p. 173, t. 8), Feejee Islands.

HYDROCLATHRUS CANCELLATUS, *Bory.* Sandwich and Feejee Islands.

ASPEROCOCCUS SINUOSUS, *Ag.* Sandwich and Society Islands.

PADINA PAVONIA, *Adans.* Feejee, Sandwich, Society, Tonga, and Wake Islands.

HALISERIS PLAGIOGRAMMA, *Mont.* Wake and Sandwich Islands.

AMANSIA GLOMERATA, *Lamour.* Feejee and Sandwich Islands.

LAURENCIA FOSTERI, *Grev.? Harv. Ner. Austr. p. 85.* Oahu.

GRACILARIA LICHENOIDES, *Ag.* Sandwich Islands.

GRACILARIA DUMOSA, *Harv. & Bail.*

*G. frondibus crassissimis dense pulvinatis dichotomis fastigiatis teretibus vel vix compressis, ramis ramulisque divaricatis, axillis rotundatis, apicibus attenuatis acutis; cystocarpis hemisphaericis sparsis.*

HAB. Tongatabu. [Since gathered abundantly by Prof. Harvey at the same island.]

Fronds occurring in dense, cushion-like mats, several inches long and broad. Each individual frond is three or four inches long, and one or two lines in diameter, much branched and bushy; the branches spreading in all directions, and very patent or even divaricate. The ramification is irregularly dichotomous; the upper branches are gradually less thick; the ultimate ramuli slender and tapering to a sharp point. Cystocarps occur sparingly on the larger branches. The color, when growing, is a dark or blackish-purple; but all the Expedition specimens have been bleached in the sun to a dirty white. The substance of the plant is cartilaginous, and the frond shrinks much in drying.

GRACILARIA FILIFORMIS, *Harv. & Bail.* (Tab. 7, fig. 8, 9.)

*G. fronde spithamæa filiformi gracili e basi dichotoma pluries divisa, ramis flexuosis, axillis obtusis, apicibus acutis vel subulatis, ramulis lateralibus vix ullis.*

HAB. Under Diamond Hill, Oahu, Sandwich Islands.

Frond 4 to 6 inches long, as thick as pack-thread, filiform, pretty regularly dichotomous, divided from the base. Axils all rounded, and apices acute. Color a dull red. More regularly dichotomous than *G. confervoides*. We have not seen the fruit.

GRACILARIA CONFERVOIDES, *Grev.* Feejee Islands.

ACANTHOPHORA MUSCOIDES, *Grev.?* Feejee Islands.

HYPNÆA MUSCIFORMIS, *Lamour.* Pacific Islands.

HYPNÆA DIVARICATA, *Grev.* Pacific Islands.

HYPNÆA RUGULOSA, *Mont.* Wailuka, Sandwich, Islands.

HYPNÆA CHLOROIDES, *Lamour.?* Var. *ramulis densissimis sæpius multifidis.*

HAB. Diamond Hill, Oahu, Sandwich Islands.

CHONDRUS CRISPUS, *Ag.* Byron's Bay, Hawaii.

GYMNOGONGRUS? DENDROIDES, *Harv. & Bail.* (Tab. 7, fig. 10, 11.)

*G. crassus, stipitatus; stipite elongato apice in ramos crebre dichotomos vel irregulares soluto, ramis nunc pluries furcatis nunc vage ramosis flexuosis ramulis lateralibus filiformibus onustis, axillis rotundatis, apicibus obtusis, ramis fructiferis nodosis favellidia numerosa foventibus.*

HAB. Cook's Rock and Byron's Bay, Hawaii, Sandwich Islands.

Fronds tufted, stipitate. Stipe 2 or 3 inches long, ending in a dendroid head of branches, which in young specimens are pretty regularly dichotomous, but in older ones irregular by the development of lateral branches. Branches terete, as thick as packthread, much curved, very irregular in division, patent, with obtuse axils and apices; the ramuli widely spreading. Structure exactly as in *Gymnogongrus*. Favellidia abundant in the ultimate branches, immersed; the branch swelling into knots where favellidia occur. Substance cartilaginous, horny when dry. Color dull brownish-red. Surface rather glossy.

We should have taken this species (which we have also from Chili; vide p. 165), to be Kützing's *G. implicatus*, had that author mentioned the stipe, which forms one of the most striking features in our plant, and which could not have been overlooked by so acute an observer as Kützing. The fruit-bearing branches are not unlike those of *Chondrus vermicularis*, from which, in other respects, our plant widely differs. It would be satisfactory to see specimens with tetraspores, a knowledge of which is necessary, in order to fix the genus definitely.

GELIDIUM INTRICATUM, *Kütz.* Pacific Islands.

GELIDIUM RADICANS, *Mont.* Feejee Islands.

GELIDIUM RIGIDUM, var. UNILATERALE, *Harv. & Bail.* (Tab. 7.)

*G. fronde lineari angusta compressa ramosa, ramis arcuatis plerumque secundis patentibus, ramulis secundis horizontalibus obtusis filiformibus.*

HAB. Tahiti, Society Islands.

Fronds 3 or 4 inches long, setaceous, compressed, vaguely branched; the principal divisions having a few distant, arching, second branchlets, two inches long or more, naked below, above furnished with several horizontally patent, filiform, second branchlets, which are either naked or bear a few other, tertiary ramuli. Color purplish, changing to green. Substance very horny.

A well-marked variety, which seems worth notice. Several specimens were collected, agreeing with the above characters.

GALAXAURA LAPIDESCENS, *Lamour.* Feejee Islands. Tongatabu.

GALAXAURA ANNULATA, *Lamour.* Waikula, Sandwich Islands.

GALAXAURA MARGINATA, *Lamour.* Feejee Islands.

LIAGORA HIRTA, *Harv. & Bail.*

*L. subcalcareo, vage ramosa; ramis alternis vel oppositis elongatis attenuatis simplicibus vel furcatis velutino-hirtis purpureis, ramulis lateralibus paucis filiformibus.*

HAB. Navigators' Islands.

Frond 4 inches or more in length, irregularly divided; the branches alternate or opposite, 3 or 4 inches long, much attenuated to the apex, and either simple or once, rarely twice, forked; either destitute of ramuli, or with a few lateral ones. All the frond is, as it were, hairy with short pile, this being the tips of the filaments of the periphery protruding through the lime-covered frond. These filaments are remarkably robust in this species.

HALIMEDA TUNA, *Lamour.*? Feejee Islands.

The lower part of our specimen is wanting, but the upper part agrees perfectly with Ellis and Solander's figure of *H. Tuna*.

CAULERPA CLAVIFERA, *Ag.* Tongatabu and Feejee Islands.

CAULERPA CLAVIFERA, *var.* LAMOUREUXII. Tongatabu.

CAULERPA FREYCINETII, *Ag.* Wilson's Island and Tongatabu.

CAULERPA MAMILLOSA, *Mont.* Rosa and Wake Islands.

CAULERPA PLUMARIS, *Ag.* Tongatabu and Feejee Islands.

CAULERPA FALCIFOLIA, *Harv. & Bail.* (Tab. 8, fig. 4, 5.)

*C. caule repente glabro, ramis erectis simplicibus vel furcatis foliosis; foliis densissimis undique insertis imbricatis falcatis compressis mucronatis.*

HAB. Tongatabu. [Also Lifuka and Vavau.—W. H. H.]

Stem slender, glabrous. Branches erect, 2 or 3 inches high, densely clothed with closely set imbricated leaves, inserted on all sides. Leaves nearly 2 lines long, compressed, falcate, mucronate.

CAULERPA PICKERINGII, *Harv. & Bail.* (Tab. 8, fig. 1-3.)

*C. caule prostrato spongioso foliis densissime vestito per totam longitudinem radicante, ramis erectis brevibus mamillæformibus spongiosis foliosis; foliis verticillatis creberrimis horizontalibus pluries dichotomis, segmentis fastigiatis apicibusque furcatis vel bimucronatis.*

HAB. Wilson's Island, Paumotu Group.

Fronds prostrate, rooting along the whole under side, branched, and densely leafy, several inches long, a quarter of an inch in diameter,

sponge-like. Branches erect, from one-quarter to half an inch high, spongy, like the stem, densely clothed with whorled patent leaves, which are so closely imbricated that their points alone are visible.

A very remarkable species, with the external habit of a *Codium*, but the structure of a *Caulerpa*. We have great satisfaction in affixing to it the name of Dr. Pickering, who collected many of the Algæ here described, and whose ethnological writings are so well-known and appreciated.

VALONIA INTRICATA, *Ag.* Tonga Islands.

DICTYOSPHERIA FAYULOSA, *Decaisne.* Wake Island.

CODIUM TOMENTOSUM, *Ag.* Sandwich Islands.

MICRODICTYON AGARDIANUM, *Decaisne.* Wilson's and Vincennes Islands, Paumotu Group.

CLADOPHORA COMPOSITA, *Harv.* Sandwich Islands, Oahu.

CLADIPHORA HERPESTICA, *Mont.* Tongatabu.

ULVA LATISSIMA, *Linn.* Oahu, Sandwich Islands.

ENTERMORPHA COMPRESSA, *Grev.* Tongatabu.

### CHLORODESMIS, *Harv. & Bail.* Nov. Gen.

GEN. CHAR. *Stipes spongiosus, e filis tenuissimis membranaceis densissime intertextis compositus, apice in fila libera penicillata desinens. Fila penicillata membranacea, continua, dichotoma, libera, ad axillas constricta, pseudo-articulata; articulis succo viridi repletis.*

CHLORODESMIS COMOSA, *Harv. & Bail.* (Tab. 8, fig. 8-10.)

HAB. Feejee Islands. [Abundant on coral-reefs at the Friendly Islands. W. H. H.]

This curious plant has the habit of a *Penicillus*, but is not in the least calcareous. The filaments of which it is composed are all delicately membranaceous, like those of a *Bryopsis*. The stipe is a quarter of an inch thick, formed of matted fibres half an inch long in the specimens, and ending in a brush-like tuft, an inch or more in length, dense and fastigate. Filaments very slender, repeatedly dichotomous, constricted at the axils; the constriction impervious? dividing the thread into articulated portions, which are filled with green fluid-matter. No carbonate of lime in any part. It closely adheres to paper in drying.

[A second reputed species of this genus is described and figured in Harvey, Ner. Bor. Amer. 3, p. 30-40, but that may possibly be a *Derbesia*. W. H. H.]

PHILIPPINE ISLANDS.

SARGASSUM SPINIFEX, *Ag.*; *J. Ag. Sp.* 1, p. 312.

TURBINARIA DENUDATA, *Bory*; *J. Ag. l. c.* p. 266.

PADINA PAVONIA, *Linn.*; *J. Ag. l. c.* p. 113.

DICTYOTA BIDENTATA, *Harv. & Bail. tab.* 8, f. 6, 7.

*D. fronde basi vix stuposa cuneata pluries dichotoma, segmentis sursum latioribus, sinibus rotundatis, apicibus junioribus acute bidentatis, areolis rectangularibus; soris minutissimis per totam paginam frondis sparsis.*

HAB. Mindanao.

Frond 6 to 8 inches long, one-fourth of an inch broad, cuneate below; the segments broader upwards, dichotomous, membranaceous; their apices acutely bidentate, the teeth angular, but not acuminate. Sori extremely minute, dot-like, scattered over the whole surface of the older parts of the frond.

Nearly allied to *D. Bartayresiana*, but broader, with less acuminate tips and smaller sori.

LAURENCIA PAPILLOSA, *Grev.*; *J. Ag. Sp.* 2, p. 756.

HALIMEDA TRILOBA, *Décaisne*?. (Specimens imperfect.)

## DIATOMACEÆ,

## AND OTHER MICROSCOPIC FORMS.

The species of *Diatomaceæ*, &c., included in the following list, were detected adhering to the dried specimens of Algæ collected in the Expedition. Among them, are a number of interesting forms which are believed to be new. These are indicated in the catalogue, by an asterisk prefixed to the name.

## PUGET SOUND, NORTHWEST AMERICA.

\* AMPHITETRAS WILKESII, *Bail. & Harv.* (Tab. 9, fig. 1, 2.)

*A. loricis prismatico-tabularibus, lateribus concavis, primaria longitudinaliter striato-punctata medio transversim zonata, secundaria quadrangula angulis productis rotundatis, superficie cellulis minutis in lineas simplices furcatasque dispositis notata, prominentiis jugalibus punctulatis.*

This beautiful species is nearly twice as large as English specimens of *Amphitetras antediluviana*, Ehr., from which it is also distinguished, by its tubular form, and by the arrangement of the cells. Its sides are deeply concave, the angles produced and rounded. The surface is covered with small cells, disposed in simple and forked lines proceeding from the centre of the discs. The specimens were found adhering to the base of *Costaria Turneri*, and other Algæ.

\* ARACHNODISCUS EHRENBERGII, *Bail.* (Tab. 9, fig. 9, 10.)

*A. disci granulis gemmaceis majoribus (in  $\frac{1}{9}$ ''' 10-12) in seriebus concentricis; cellulis concentricis nullis; radiis 20-31 æqualibus, interjectis sæpe brevioribus. Diam.,  $\frac{1}{16}$ '''*

The first published account of a species of this genus, was given by Ehrenberg, in the Berlin Monatsbericht, 1848, p. 7, where he found

for its reception the genus *Hemiptychus*. In the Monatsbericht for 1849, he discards this name, in consequence of its prior application to a genus of insects, and adopts the very appropriate and descriptive name of *Arachnodiscus*, which was first used in England, by whom we are not informed. We find, however, that in Queckett's Histological Catalogue, in the Museum of the Royal College of Surgeons, published in 1850, a species of this genus is given on the authority of Mr. H. Deane. The present is a truly elegant species, and well worthy to bear the name of the distinguished microscopist which we have attached to it. It consists of discoid cylinders, adhering by their circular bases to the fronds of various *Algæ*. The discs are covered, except near the centre, with large granules, disposed in concentric circles. A small circular space in the centre is smooth, but is surrounded by a series of elongated cells arranged in a radiating manner. The beauty of the shell is much increased by a series of radiating lines, commencing near the circumference, but not reaching the centre, between which a shorter set is interposed, which in their turn have one or more still shorter ones alternating with them.

\* COCCONEIS RHOMBIFER, *Bail. & Harv.* (Tab. 9, fig. 3, 4.)

*C. late elliptica vel suborbicularis, linea media oblique longitudinali sigmoidea areolam glabratam dimidiante, quæ apice basique attenuata est et versus umbonem in rhombi formam ampliata, superficie decussatim et transversim punctata.*

Lorica elliptical or nearly circular, and marked with a smooth, central, sigmoid space, which widens in the centre, and assumes a rhombic form. Surface minutely punctate, producing the appearance of transverse and decussating striæ. Abundant on *Algæ* from Puget Sound.

\* COCCONEIS SULCATA, *Bail. & Harv.* (Tab. 9.)

*C. late elliptica vel suborbicularis, transversim sulcata, sulcis 30-40 arcuatis.*

A small species, somewhat resembling *C. scutellum*, Ehr., but distinguished by the distinct grooves upon the surface.

ACTINOPTYCHUS SENARIUS, *Ehr.*

COSCINODISCUS OCVLIS-VIRIDIS, *Ehr.*



COSCINODISCUS RADIATUS, *Ehr.*

COSCINODISCUS EXCENTRICUS, *Ehr.*

DICTYocha SPECULUM, *Ehr.*

EPITHEMIA GIBBERULA, *Kütz.*

\* AULACODISCUS OREGONENSIS, *Bail. & Harv.* (Tab. 9, fig. 6.)

*A. lorica promentiis 13 intramarginalibus instructa, a quibus tot radii fere ad umbonem procurrent, superficie præter umbonem glaberrimum minute punctata iridescente.*

Lorica with 13 foot-like processes near the circumference, from which rays extend nearly to the centre. The whole surface, except a small, smooth, circular, central space, minutely punctate and iridescent, as in many species of the genus *Actinocyclus*.

GRAMMATOPHORA ANGULOSA, *Ehr.*

GRAMMATOPHORA STRICTA, *Ehr.*

GRAMMATOPHORA UNDULOSA, *Ehr.*

ISTHMIA OBLIQUATA, *Ag.* (*I. nervosa*, *Kütz.*) Abundant and large.

RHABDONEMA ARCUATUM, *Kütz.*

SURIRELLA FASTUOSA, *Ehr.*

\* TRICERATIUM WILKESII, *Bail. & Harv.* (Tab. 9, fig. 7, 8.)

*T. lorica lateribus convexiusculis, angulis rotundatis, superficie triquetra cellulis minutis in lineas radiantes simplices furcatasque co-ordinatis notata, prominentiis jugalibus punctulatis.*

Lorica with the sides slightly concave; the angles rounded; basal faces triangular. Surface with small cells arranged in single and forked radiating lines, as in *Amphitetras Wilkesii*. Connecting processes of the three angles minutely punctate.

SPONGIOLITES AGARICUS, and other species.

#### SAN FRANCISCO, CALIFORNIA.

ARACHNODISCUS EHRENBERGII, *Harv. & Bail.* supra, p. 174.

COCCONEIS SCUTELLUM, *Ehr.*

GOMPHONEMA MINUTISSIMA, *Ehr.*

## TERRA DEL FUEGO.

ENTOPYLA AUSTRALIS, *Ehr.*

GRAMMATOPHORA SERPENTINA, *Ehr.*

GRAMMATOPHORA STRICTA, *Ehr.*

## RIO DE JANEIRO.

CLIMACOSPHERIA MONILIGERA, *Ehr.* (Tab. 9, fig. 11.)

A somewhat marked form, with transverse striæ, exceedingly minute.

GRAMMATOPHORA OCEANICA, *Ehr.*

\* ISTHMIA MINIMA, *Bail. & Harv.* (Tab. 9, fig. 11.)

*T. zona transversali subtilissime decussatim punctata, lateribus cellulis magnis granulatis.*

Lorica with the end divisions coarsely granulated, and the middle band minutely punctate in a decussate manner.

Also detected in the Sooloo Sea. Appears to differ from *I. enervis*, *Ehr.*, in the smaller size, as well as in the much more minute markings on the central band.

DICTYOCHA SPLENDENS, *Ehr.* (Tab. 9, fig. 16.)

We have seen this form (which Ehrenberg doubtfully referred to his genus *Dictyocha*) under the action of acids dissolve with effervescence, thus proving its calcareous nature.

SPONGIOLITES ANCHORA, *Ehr.* (Tab. 9, fig. 17.)

This also proves to be calcareous: like the last, it polarizes light and dissolves in acids.

## VALPARAISO.

ACTINOPTYCHUS TERNARIUS, *Ehr.*

COCCONEIS SCUTELLUM, *Ehr.*

DICTYocha SPECULUM, *Ehr.*

GAILLIONELLA SULCATA, *Ehr.*

GRAMMATOPHORA HAMATA, *Ehr.*

STAUROPTERA ASPERA, *Ehr.*

## PHILIPPINE ISLANDS.

\* AMPHITETRAS FAVOSA, *Bail. & Harv.* (Tab. 9.)

*A. loricis tabularibus? lateribus vix concavis, primaria?; secundaria quadrangula, angulis fere rectis vix productis, superficie cellulis magnis hexagonis tessellata.*

HAB. In mud, adhering to a Hammer oyster, from Mindanao.

Only the terminal faces of this beautiful form have yet been seen; but these are sufficient to distinguish it from all known species of *Amphitetras*, by the peculiar hexagonal markings, resembling those of *Triceratium Favus*, *Ehr.*

AMPHORA LYBICA, *Ehr.*

BIDDULPHIA? PULCHELLA, *Gray.*

A form agreeing closely with *Biddulphia pulchella*, but having the central spines characterizing Ehrenberg's genus *Denticella*, is common at Mindanao, and at many of the Pacific Islands.

\* CAMPYLODISCUS KÜTZINGII, *Bail. & Harv.* (Tab. 9, fig. 20.)

*C. sellæformis, late marginatus, sulcis sub-50 transversis continuis curvatis impressus.*

HAB. Mindanao.

Lorica saddle-shaped, marked with about fifty transverse and curved furrows, which are nearly obsolete in the middle. It resembles *C. radians*, of Ehrenberg; but the furrows in our species are more regular, and pass completely across the shell.

COSCINODISCUS LINEARIS, *Ehr.*

ZYGOCERAS MARGARITACEUM. (Tab. 9, fig. 31.)

GAILLONELLA SULCATA, *Ehr.*

GRAMMATOPHORA OCEANICA, *Ehr.*

\* LAGENA WILLIAMSONII, *Bail. & Harv.* (Tab. 9, fig. 33.)

*L. testa bicellulosa; cellulis diversis, inferiore ellipsoidea longitudinaliter costata in isthmum infundibuliformem attenuata et ad cellulam superiorem semi-lageniformem (vel inverse infundibuliformem) ferruminata; collo breviusculo recto; ore subampliato.*

HAB. Found in mud, attached to a Hammer oyster, Mindanao.

Shell, with two cells; the upper one ellipsoidal, with longitudinal ribs, connected by a narrow neck to the lower cell, which in shape resembles two funnels with their larger openings placed together. Aperture slightly expanded.

We dedicate this species to Professor Williamson, of Manchester, England, whose valuable memoir on the species of *Lagena*, may be found in the Annals and Magazine of Natural History.

NAVICULA ELONGATA? & N. LYRA, *Ehr.*

PINNULARIA DIDYMA, *Ehr.*

STAUROPTERA ASPERA, *Ehr.*

SURIELLA FASTUOSA, *Ehr.*

TERSPIKE MUSICA, *Ehr.?* (Tab. 9, fig. 12-13.)

\* TRICERATIUM ORIENTALE, *Bail. & Harv.* (Tab. 9, fig. 9.)

*T. magnum, lateribus convexis, angulis productis obtusis, superficie triquetra cellulis magnis hexagonis favosa.*

HAB. Mindanao; in mud, on Hammer oysters.

Lorica larger than in *T. Favus*, with the sides convex and the angles much produced and rounded: the surface is reticulated, nearly as in *T. Favus*.

CONIODICTYON SPLENDENS, *Ehr.*

SPONGIOLITES ANCHORA, *Ehr.*

SPONGIOLITES AGARICUS, *Ehr.*

*SOOLOO SEA.*

*COSCINODISCUS EXCENTRICUS*, Ehr.

*COSCINODISCUS MARGINATUS*, Ehr.

*GAILLIONELLA SULCATA*, Ehr.

*GRAMMATOPHORA OCEANICA*, Ehr.

*ISTHMIA MINIMA*, Bail. & Harv.

*SURIELLA FASTUOSA*, Ehr.

*TRICERATIUM ORIENTALE*, Bail. & Harv.

*SPONGIOLITES AGARICUS*, Ehr. (Tab. 9, fig. 21-23.)

Figure 21 shows a group of these curious bodies, as they were found in the interstices of a sponge, having needle-shaped, siliceous spiculæ.

*NEW ZEALAND.*

It is remarkable, that not a single Diatomacea was detected on the numerous specimens of *Algæ* from New Zealand, although a careful search was made for them.

*FEEJEE ISLANDS.*

*ANPHIPRORA CONSTRICTA*, Ehr.

*BIDDULPHIA*? *PULCHELLA*, Gray.

*STAUROPTERA ASPERA*, Ehr.

*WILSON'S ISLAND, PAUMOTU GROUP.*

*CLIMACOSPHERIA MONILIGERA*, Ehr.

*PINNULARIA DIDYMA*, Ehr.

*PODOCYSTIS ADRIATICA*, Kütz. (Tab. 9, fig. 27.)

*STAUROPTERA ASPERA*, Ehr.

## TAHITI.

BIDDULPHIA ? PULCHELLA, Gray.

CLIMACOSPHERIA MONILIGERA, Ehr.

COCCONEIS PARMULA, Bail. & Harv. (Tab. 9, fig. 28.)

*C. late elliptica, linea media longitudinali notata, utroque latere costis (vel sulcis) transversis magnis 10-12 irregularibus impressa, superficie transversim striato-granulata.*

Lorica broadly elliptical, with a longitudinal line through the middle, and 10 to 12 large and irregular transverse ribs or grooves. Surface with transverse rows of minute, rounded granulations.

COCCONEIS FASTUOSA, Ehr.

EPITHEMIA MUSCULUS, Kütz.

GAILLIONELLA SULGATA, Ehr.

GRAMMATOPHORA OCEANICA, Ehr.

\* HYALOSIRA PUNCTATA, Bail. & Harv. (Tab. 9, fig. 29-30.)

*H. loricis magnis in catenas longas co-ordinatis rectangulis subquadratis transversim interrupte vittatis; vittis medio loricæ alternantibus granulatis, alternis serie punctarum insignium ornatis.*

Loricæ large, quadrangular, united in ribbons. Individuals nearly square, with transverse, granulated striæ, which alternate at the middle line; the alternate striæ marked with rows of large internal dots.

NAVICULA ELONGATA ?

NAVICULA SIGMA, Ehr.

PINNULARIA PEREGRINA, Ehr.

PODOCYSTIS ADRIATICA, Kütz. (Tab. 9, fig. 27.)

STAUROPTERA ASPERA, Ehr.

\* TRICERATIUM CONCAVUM, Bail. & Harv. (Tab. 9, fig. 24-26.)

*T. lorica lateribus valde concavis angulis rotundatis, superficie ut in T. Wilkesii notata.*

This species, in its deeply concave sides and peculiar markings, appears quite distinct from all except *T. Wilkesii*, of which it may be a variety.

\* TRICERATIUM GIBBOSUM, *Bail. & Harv.* (Tab. 9, fig. 32.)

*T. parvum*, subcylindricum, lateribus valde convexis, angulis prominentibus, superficie ut in *T. Wilkesii* notata.

A small species, remarkable for its almost cylindrical form.

#### TONGATABU.

SYNEDRA SUPERBA, *Kütz.*

SYNEDRA BICEPS, *Kütz.*

GRAMMATOPHORA OCEANICA, *Ehr.*

EPITHEMIA MUSCULUS, *Kütz.*

BIDDULPHIA PULCHELLA, an DENTALLA?.

## EXPLANATION OF THE PLATES.





## EXPLANATION OF THE PLATES.

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PLATE I.—Fig. 1. *SARGASSUM SINCLAIRII*, Hook. & Harv.; a specimen, of the natural size. Fig. 2. A single leaf. Fig. 3. Leaves and air-vessels. Figs. 4, 5. Air-vessels. Fig. 6. Cross-section of the stem near the base.

PLATE II.—Fig. 1. *APOPHLŒA SINCLAIRII*, Harv.; drawn from a *dried* specimen. The plant swells much when moistened. Fig. 2. Portion of a transverse section, showing one of the numerous conceptacles, much magnified.

“ Fig. 3. *NOTHEIA ANOMALA*, Harv. & Bail.; a plant, of the natural size, parasitic on *Hormosira*. Fig. 4. A branch, magnified. Fig. 5. A perispore, with parane mata. Fig. 6. A cross-section, showing a scaphidium; much magnified.

PLATE III.—Fig. 1. *IRIDÆA LUSORIA*, Harv.; a large specimen. Fig. 2. Portion of a cross-section of the frond, much magnified, showing the position of the spores. Figs. 3, 4. Spores, still more magnified.

PLATE IV.—Fig. 1. *RHODYMENIA WILKESII*, Harv. & Bail.; a large specimen, of the natural size. Fig. 2. Magnified section through one of the coccidia. Fig. 3. Magnified section of the frond.

PLATE V.—Fig. 1. *GIGARTINA EXASPERATA*, Harv. & Bail.; large specimen, of the natural size. Fig. 2. Section of the frond, magnified.

PLATE VI.—Fig. 1. *NOSTOC EXPANSUM*, Harv. & Bail.; natural size. Fig. 2. Magnified section of the frond.

“ Fig. 3. *GIGARTINA MOLLIS*, Harv. & Bail.; frond, of the natural size. Fig. 4. Portion of a cross-section of the same, much magnified.

“ Fig. 5. *GYMNOGONGRUS VERMICULARIS*, J. Ag.; not magnified. Fig. 6. Cross-section of the same, much magnified.

PLATE VII.—Fig. 1. *CHONDRUS EXILIS*, Harv. & Bail.; frond, not magnified. Fig. 2. Portion of the same, magnified.

“ Fig. 3. *ECTOCARPUS NAMULOSUS*, Harv. & Bail.; a tuft of the plant, of the natural size. Fig. 4. Filament and branches, magnified. Fig. 5. Branch and spores, much magnified.

“ Fig. 6. *CHONDRUS UNCIALIS*, Harv. & Bail.; frond, not magnified. Fig. 7. Portion of the same, magnified.

“ Fig. 8. *GRACILARIA FILIFORMIS*, Harv. & Bail.; frond, of the natural size. Fig. 9. Cross-section of the same, magnified.

“ Fig. 10. *GYMNOGONGRUS DENDROIDES*, Harv. & Bail.; a specimen from Hawaii. Fig. 11. A specimen from Callao.

“ Fig. 12. *GELIDIUM RIGIDUM*, var. *UNILATERALE*, Harv. & Bail.; frond, not magnified. Fig. 13. Magnified cross-section of the same.

PLATE VIII.—Fig. 1. *CAULERPA PICKERINGII*, Harv. & Bail.; plant, of the natural size. Fig. 2. Magnified cross-section, showing the arrangement of the verticillate leaves. Fig. 3. A leaf, still more magnified.

“ Fig. 4. *CAULERPA FALCIFOLIA*, Harv. & Bail.; natural size. Fig. 5. Leaves, magnified.

“ Fig. 6. *DICTYOTA BIDENTATA*, Harv. & Bail.; a frond, not

magnified, from the Philippine Islands. Fig. 7. Same, from the Feejee Islands.

PLATE VIII.—Fig. 8. *CHLORODESMIS COMOSA*, Harv. & Bail.; a tuft, of the natural size. Fig. 9. A filament, magnified. Fig. 10. A portion still more magnified, showing the constrictions near the axils.

PLATE IX.—Fig. 1. *AMPHITETRAS WILKESII*, Bail. & Harv.; top view. Fig. 2. Oblique view.

“ Fig. 3. *COCCONEIS RHOMBIFER*, Bail. & Harv.; upper valve. Fig. 4. Lower valve.

“ Fig. 5. *COCCONEIS SULCATA*, Bail. & Harv.

“ Fig. 6. *AULACODISCUS OREGONENSIS*, Bail. & Harv.

“ Fig. 7. *TRICERATIUM WILKESII*, Bail. & Harv.; top view. Fig. 8. Chain of three frustules, moderately magnified.

“ Fig. 9. *ARACHNODISCUS EHRENBERGII*, Bail.; moderately magnified, showing two specimens attached to an Alga. Fig. 10. A single disc, much magnified.

“ Fig. 11. *ISTHMIA MINIMA*, Bail. & Harv.

“ Fig. 12. *TERPSINOE MUSICA*, Ehr.; two frustules. Fig. 13. Side view.

“ Fig. 14. *CLIMACOSPHERIA MONILIGERA*, Ehr.; front view. Fig. 15. Side view.

“ Fig. 16. *DICTYOCHA SPLENDENS*, Ehr.

“ Fig. 17. *SPONGIOLITES ANCHORA*, Ehr.

“ Fig. 18. *AMPHITETRAS FAVOSA*, Bail. & Harv.

“ Fig. 19. *TRICERATIUM ORIENTALE*, Bail. & Harv.

“ Fig. 20. *CAMPYLODISCUS KUTZINGII*, Bail. & Harv.

“ Fig. 21. *SPONGIOLITES AGARICUS*, Ehr.; in situ, forming globular groups among the meshes of a sponge having pin-shaped spiculæ. Figs. 22, 23. Separate specimens.

“ Fig. 24. *TRICERATIUM CONCAVUM*, Bail. & Harv.; top view. Fig. 25. Edge view. Fig. 26. Side view.

“ Fig. 27. *PODOCYSTIS ADRIATICA*, Kütz.

“ Fig. 28. *COCCONEIS PARMULA*, Bail. & Harv.

“ Fig. 29. *HYALOSIRA PUNCTATA*, Bail. & Harv.; single

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PLATE IX.—Fig. 31. *ZYGOCERAS MARGARITACEUM*.

“ Fig. 32. *TRICERATIUM GIBBOSUM*, Bail. & Harv.; top view.

“ Fig. 33. *LAGENA WILLIAMSONII*, Bail. & Harv.

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F U N G I.

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## F U N G I.

### 1. AGARICUS (PLEUROPUS) LAGOTIS, *Berk. & Curt.* (Tab. 1, Fig. 1.)

*A. pileo sessili elongato-conchiiformi, antice latiori, strato superiore gelatinoso setoso-velutino; lamellis subconfertis.*

HAB. Oahu, Sandwich Islands; on wood.

Pileus a quarter of an inch long, sessile, narrowed behind, broad in front; the upper surface clothed with dense and short soft bristles, at length naked in front. Gills moderately close, tawny when dry, the edge entire. Spores white, round-oval.

Allied to *A. atropurpureus*, but differing in the coarse velvety coat, which resembles that of *Exidia hispidula*, Berk. It also bears a strong resemblance to *Lentinus pelliculosus*, but the hairs are not fasciculate as in that species, nor are the gills toothed, not to mention the generic difference.

### 2. AGARICUS IGNOBILIS, *Berk.*

*A. ignobilis*, Berk. in Hook. Lond. Jour. Bot. 1, p. 452.

HAB. Feejee Islands.

### 3. AGARICUS (FLAMMULA) CRESCUS, *Berk. & Curt.* (Tab. 1, Fig. 2.)

*A. aureus; pileo carnoso excentrico pilis innatis subtiliter squamoso; stipite brevi obeso; lamellis postice emarginatis confertis; sporis minoribus ellipticis.*

HAB. Waya-ruru Bay, New Zealand; on wood.

Pileus three inches broad, sprinkled with obscure appressed pilose scales. Stem seven lines long, four thick, paler than the pileus, furfuraceo-tomentose; gills broad, strongly emarginate or sinuated behind, scarcely adnate, of a uniform golden yellow, not spotted. Closely allied to *A. aureus*, but differing in its short excentric ringless stem, and far smaller spores.

4. AGARICUS ———, non determinandus.

HAB. Mauna Kea, Hawaii, Sandwich Islands.

5. CANTHARELLUS AURANTIACUS, *Fries.*

HAB. Fort Vancouver, Oregon.

6. LENTINUS WILKESII, *Berk. & Curt.* (Tab. 1, Fig. 3.)

*L. tener*; pileo profunde infundibuliformi subtiliter tomentoso lineato; stipite subæquali sursum furfuraceo deorsum nigro; lamellis confertissimis tenerrimis spiculiferis.

HAB. Feejee Islands; on wood.

About an inch broad, deeply infundibuliform, white, obscurely tomentose, finely streaked; margin slightly incurved; stem a quarter of an inch long, scarcely a line thick, nearly equal, black below, pale and furfuraceous above; gills extremely delicate and close, spiculiferous; edge very finely notched.

Closely resembling *L. pergameneus*, Lev., but more infundibuliform, and with much more crowded gills.

7. SCHIZOPHYLLUM COMMUNE, *Fries.*

HAB. Sandwich Islands, in several localities.

8. LENZITES REPANDA, *Fries.*

HAB. Samoan Group, Navigators' Islands.

9. TRAMETES AUSTRALIS, *Fries*, var.

HAB. Mangsi Islands.

10. TRAMETES LACTEA, *Berk.* l. c. 1, p. 322.

HAB. Woolongong, New South Wales.

11. POLYPORUS PERENNIS, *Fries.*

HAB. Island of Madeira.

12. POLYPORUS SANGUINEUS, *Fries.*

HAB. Brazil; also Feejee and Mangsi Islands.

13. POLYPORUS BRUNNEOLUS, *Berk.*

Var. OPACUS: *pileo renato flabelliformi, antice lobato tenui crebri-zonato sulcato opaco subtiliter tomentoso, postice hic illic fucato glabro pallide brunneolo zonis obscurioribus; stipite brevissimo disciformi; hymenio albido; poris minutis punctiformibus, acie integra obtusa.*

HAB. Samoan Islands.

There is but a single specimen of this in the collection, which agrees pretty well with one of the original specimens of *P. brunneolus* from the Philippine Islands.

14. POLYPORUS FLABELLIFORMIS, *Klotsch.*

HAB. Sandal-wood Bay, Feejee Islands.

15. POLYPORUS AUSTRALIS, *Fries.*

HAB. Ovolau, Feejee Islands.

16. POLYPORUS CINNABARINUS, *Fries.*

HAB. Feejee Islands, New Zealand, and New South Wales.

17. POLYPORUS VELLEREUS, *Berk.*, var. *poris minoribus.*

HAB. Puget's Sound, Oregon.

18. POLYPORUS LITURARIUS, *Berk. & Curt.* (Tab. 1, Fig. 5.)

*P. carnosus, tenuis* ; pileo flabelliformi glabro lineolato ; stipite brevissimo cum pileo postice attenuato confluyente ; poris minutis angulatis, dissepimentis tenuissimis denticulatis.

HAB. Ovolau, Feejee Islands ; on wood.

Pileus one and one-third of an inch broad, one and one-quarter of an inch long, slightly lobed, reddish-brown, marked with fine radiating lines, slightly depressed behind, where it is confluent with the extremely short though strictly-defined stem ; edge slightly incurved. Hymenium probably white.

A very distinct species, to which we cannot point out any near ally. *P. Drummondii* is perhaps the nearest. It also resembles *P. sector*, but has no raised lines, and is quite smooth.

## 19. POLYPORUS (imperfectus).

HAB. Samoan Group, Navigators' Islands.

20. FAVOLUS PLATYPORUS, *Berk. & Curt.* (Tab. 1, Fig. 4.)

*F. pileo reniformi sublobato rigidiusculo glabro e contextu supra dissepimenta contracto reticulato; poris amplis oblongis subhexagonis, dissepimentis emarginatis rigidis, acie subintegra.*

HAB. Feejee Islands.

Pileus two and a half inches broad, one and one-half of an inch long, depressed behind, reticulated by the contraction of the substance above the dissepiments, edge very thin and acute. Stem extremely short, disciform. Dissepiments scooped out in the middle; pores two lines or more long, one line broad, but varying much in size.

Nearly allied to *F. alutaceus*, Mont. & Berk., but differing in its larger pores and reticulated surface. The pores are more rigid than in any other species with which we are acquainted, except an undescribed species from Canada, which has not however the articulated pileus. *F. intestinalis*, Berk., has pores as large, but is totally different in other respects. A specimen of this species, collected in Java by Horsfield, is in the Schweinitzian Herbarium under the name of *Polyporus Favus*.

21. THELEPHORA LAMELLATA, *Berk. & Curt.* (Tab. 1, Fig. 7.)

*T. tota ochracea; pileo infundibuliformi lobato rugoso-lamellato subtiliter tomentoso; stipite elongato velutino-tomentoso; hymenio sulcato rugoso glabro.*

HAB. Feejee Islands.

Pileus two inches broad, one and one-quarter of an inch deep, lobed, subpubescent, clothed with permanent appressed down, coarsely lamellate-rugose. Stem equal, cylindrical, one and one-half of an inch high,



two lines thick, densely downy, almost velvety, solid. Hymenium rugoso-plicate. The whole is of a beautiful ochre or tan.

This species is rather larger than *T. caperata*, Berk. & Mont., is more strongly lamellate, has a very different kind of coat, and a long almost velvety stem. It does not appear whether this, like *T. caperata*, grows on wood.

22. THELEPHORA AURANTIACA, *Pers.*

Var? *pileo diutius infundibuliformi glabriore.*

HAB. Samoan Group; on wood. Navigators' Islands.

23. THELEPHORA SCABRA, *Berk. & Curt.* (Tab. 1, Fig. 6.)

*T. albida*; *pileo anguste flabellato-diviso furcato-lobato granulato-scabro*; *hymenio striato.*

HAB. Ovolau, Feejee Islands; on the earth.

Pileus one and a quarter of an inch high; main divisions greatly attenuated below, dilated above and incised, with the lobes incised or furcate, rough with little granular warts. Hymenium smooth, striate.

Closely allied to *T. pallida*, Schwein., but distinguished by its rough pileus, which, however, may prove to be an inconstant character.

24. STEREUM LOBATUM, *Fries.*

HAB. Bay of Islands, New Zealand.

25. STEREUM COMPLICATUM, *Fries.* var.

HAB. Ovolau, Feejee Islands.

26. *EXIDIA HISPIDULA*, Berk. in *Ann. Nat. Hist.* 3, 396.

HAB. New Zealand, Sandwich, and Mangsi Islands.

27. *BATARREA PHALLOIDES*, Pers.

HAB. Oregon.

28. *LYCOPERDON PUSILLUM*, Batsch.

Var. *sporibus paullo majoribus pedicellatis*.

HAB. Bay of Islands, New Zealand.

29. *CLATHRUS (LATERNEA) TRISCAPUS*, Fr.

HAB. Relief Bay, Fuegia.

No specimen is extant; but a drawing, by Mr. Agate, made January 28, 1839, appears to represent this species, the original habitat of which was unknown.

30. *HYPOXYLON CONCENTRICUM*, Bolt.

HAB. Volcano of Maui, Sandwich Islands, at the height of six thousand feet above the sea; on branches.

31. *HYPOXYLON PILÆFORME*, Berk. & Curt. (Tab. 1, Fig. 8.)

*H. globosum, stipitatum et sessile, piceo-laccatum, ostioliis prominulis exasperatum, intus album; stipite crasso rugoso.*

HAB. Mountains behind Honolulu, Oahu, Sandwich Islands.

There are two specimens of this, one of which is depresso-globose, produced at base into a short rugged stem nearly as long as the head, the whole three-quarters of an inch high; the other sessile, or with a mere rudiment of a stem, and deformed, as if by the partial confluence of two or three heads, thus somewhat resembling a small undulate form of *H. concentricum*. The species is closely allied to *H. polymorphum*, but the sporidia are shorter and thicker. It resembles *H. obovata*, Berk., and *S. poculiformis*, Mont., but is distinguished from both by its prominent ostiola, and rough coarse stem.

Fries (in Nov. Symb. Myc. p. 114) expresses the opinion that this species is his *H. globosum*.

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#### EXPLANATION OF THE PLATE.

- Fig. 1.—*AGARICUS LAGOTIS*; upper and under view.  
Fig. 2.—*AGARICUS CRÆSUS*; upper and under view.  
Fig. 3.—*LENTINUS WILKESII*; seen from above and from beneath.  
Fig. 4.—*FAVOLUS PLATYPORUS*; upper and under view, and section.  
Fig. 5.—*POLYPORUS LITURARIUS*; upper and under view, and a portion of the under face, magnified.  
Fig. 6.—*THELEPHORA SCABRA*.  
Fig. 7.—*THELEPHORA LAMELLATA*.  
Fig. 8.—*HYPOXYLON PILÆFORME*; with a section; a portion of the section magnified; an ascus with spores, and a separate spore, more magnified.

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PHANEROGAMIA

OF THE

UNITED STATES EXPLORING EXPEDITION.



PHANEROGAMIA

OF

PACIFIC NORTH AMERICA.

BY

JOHN TORREY.





## P R E F A C E.

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ABOUT twelve years have elapsed since the late Dr. Torrey prepared this Report upon the Phanerogamous plants collected by the naturalists of the Expedition upon the Pacific coast of this country. Circumstances beyond his control have delayed the printing of it until now. The plates only have been published, a small edition having been distributed among botanists, both in this country and in Europe. In the delay and uncertainty of its being published, a considerable number of alterations—affecting only some minor points—which had been decided on in the course of a revision of the manuscript by Dr. Torrey and myself, have, under the circumstances, failed to be attended to up to the time when, not long ago, the manuscript was called for that it might be placed in the printer's hands. Before Dr. Torrey could give attention to the manuscript, he was attacked by the illness under which his valuable life was terminated on the 10th of March last. Foreseeing that he would probably not be able to revise this Report himself, he committed the manuscript to my hands and desired me to edit it. He instructed me to make such corrections as we had long before found to be needful, and also to attend to the few changes of nomenclature which have become necessary on account of recent publications, whether by himself or by other botanists.

I have revised the manuscript in accordance with these instructions of my lamented friend and colleague, and also in accordance with the understood wishes of the Library Committee that the Report should be printed as nearly in the state the author left it as well might be.

There has, of course, been no attempt to bring the Report down to the present day. It represents our knowledge in respect to the subject-matter as it was a dozen years ago, except where Dr. Torrey has himself introduced references or views of a later date, and except the very few cases in which published names inevitably supersede those imposed by the author and still in manuscript. Otherwise my work has been almost wholly of a clerical kind, or has related to the correction of oversights, to typographical arrangement, &c. Whenever an explanatory remark was thought needful it has been added. But all such notes are inclosed within brackets.

It is much to be regretted that this Report was not printed and published, as was expected, in the year 1861, and that it did not receive the final corrections which the lamented author would have given, if he had himself lived to see it through the press. To do the best that can be done with it under the actual circumstances has been the endeavor and the sacred and sad duty of the present editor.

ASA GRAY.

WASHINGTON, April 15, 1873.

# PHANEROGAMOUS PLANTS

COLLECTED IN

## WASHINGTON TERRITORY, OREGON, AND CALIFORNIA.

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### ORD. 1. RANUNCULACEÆ.

#### 1. CLEMATIS, *Linn.*

##### 1. CLEMATIS DOUGLASHII, *Hook.*

*Clematis Douglasii*, Hook. Fl. Bor.-Am. 1, p. 1, t. 1; Torr. & Gray, Fl. 1, p. 8.

HAB. Columbia River from Spokane to the Kooskooskee.—Plant two to three feet high. Plumose tails of the fruit about two inches long.

##### 2. CLEMATIS LIGUSTICIFOLIA, *Nutt., in Torr. & Gray, l. c.*

Var. BRACTEATA: *foliolis 3-5 late cordatis inciso-lobatis dentatisve utrinque glabris, floralibus bracteantibus obovatis multo majoribus integris.*

HAB. Willamette River, Oregon.—The leaflets, especially of the floral leaves, are unusually large.

## 3. CLEMATIS (ATRAGENE) VERTICILLARIS, DC.

HAB. Upper tributaries of the Columbia River, and on the Kooskooskee.—To this belongs *Atragene Columbiana*, Nutt. The flowers are smaller than those of the eastern plant; the tails of the fruit about two inches long and very slender.

## 2. ANEMONE, Linn.

## 1. ANEMONE MULTIFIDA, Poir.

HAB. Columbia River, between the mouth of the Spokane and Fort Colville.—A species of wide range and of still somewhat uncertain limitation.

## 2. ANEMONE NEMOROSA, Linn.

HAB. High, shady water-courses in the interior of Oregon. Seemingly of rare occurrence west of the Rocky Mountains.

## 3. ANEMONE DELTOIDEA, Hook.

HAB. Nisqually, Puget Sound.—Well represented in Hook. Fl. Bor.-Am. 1, t. 3, f. A.

## 4. ANEMONE NARCISSIFLORA, Linn.

HAB. Port Townsend Harbor, Washington Territory.—A high northern species.

## 3. THALICTRUM, Linn.

## 1. THALICTRUM DIOICUM, Linn., var. OXYCARPUM.

HAB. Mountainous places in the interior of Washington Territory.—This has the foliage and flowers of *T. dioicum*, but the fruit is nearly twice as long, as well as narrower in proportion, and remarkably

acuminate. It seems to be the same as a plant collected in Oregon by Nuttall, in blossom only, and named *T. heterophyllum*, but never published. [Probably *Thalictrum occidentale*, Gray, Proceed. Amer. Acad. 8, p. 372.]

#### 4. TRAUTVETTERIA, *Fisch. & Mey.*

##### 1. TRAUTVETTERIA GRANDIS, *Nutt., l. c.*

HAB. Washington Territory, on the wooded slopes of the Cascade Mountains.—The character of the thin and membranaceous leaves seems to hold constant; but the fruit has not yet been compared with that of the Eastern *T. palmata*.

#### 5. RANUNCULUS, *Linn.*

##### 1. RANUNCULUS AQUATILIS, *Linn.*

HAB. Gray's Harbor, Washington Territory, and in the interior of Oregon.—One of the subspecies with the leaves all dissected into filiform divisions; but the fruit is not sufficiently mature for determining to which it really belongs.

##### 2. RANUNCULUS FLAMMULA, *Linn.*

HAB. Interior of Oregon, and alpine prairies on the upper waters of the Columbia River.—This is the genuine *R. Flammula* of the Old World, as the carpels show: some of the specimens belong to a dwarf form.

##### 3. RANUNCULUS AFFINIS, *R. Br., var. LASIOCARPUS.*

HAB. Columbia River, between the Spokane and Fort Colville.—One of the forms of this polymorphous species, with villous carpels.

4. *RANUNCULUS ORTHORHYNCHUS*, Hook., l. c.

HAB. Nisqually, Puget Sound.—The hairs of the stem are rigid and spreading, not appressed as described and figured by Hooker. The leaves vary greatly, but the species is a very distinct one.

5. *RANUNCULUS GLABERRIMUS*, Hook.

HAB. Valleys near the Kooskooskee River, Mr. Spalding: specimens which accord well with the character and figure given by Hooker (Fl. Bor.-Am. 1, p. 12, t. 5, A.) of this very rare species.

6. *RANUNCULUS PENNSYLVANICUS*, Linn.

HAB. On the Columbia River, between the Spokane and Fort Colville.—The flowers are larger than in the plant of the Eastern States, but in other respects there is no marked difference.

7. *RANUNCULUS TENELLUS*, Nutt., in Torr. & Gray.

HAB. Nisqually, Puget Sound. [In Proceed. Amer. Acad. 8, p. 374, this is combined with the next, under the name of *R. Nelsonii*, var. *tenellus*, Gray.]

8. *RANUNCULUS OCCIDENTALIS*, Nutt., l. c.

Var. *PARVIFLORUS*: *floribus multo minoribus; stylis carpello subhispido longioribus.*

HAB. Plains between Puget Sound and the Cascade Mountains.—This variety differs from the ordinary form of *R. occidentalis* in the very small flowers, which are not larger than those of *R. recurvatus*. The stem is about a foot high, and thinly clothed with retrorse-spreading stiffish hairs. The leaves are as in *R. occidentalis*. Petals oblong, scarcely exceeding the sepals. Carpels hispid with a few hairs, which are mostly situated on the back. [This plant is the *R. Nelsonii*, forma *typica*, Gray, l. c.]

9. *RANUNCULUS REPENS*, *Linn.*

HAB. Port Discovery, Washington Territory; common.—The specimens belong to a hairy form which is common in the Eastern States.

6. *MYOSURUS*, *Dill.*1. *MYOSURUS MINIMUS*, *Linn.*

HAB. Puget Sound, and on the Columbia and Kooskooskee Rivers.—This plant is widely diffused over the western and southwestern parts of the United States and Territories, especially in those parts which were settled by French and Spanish people, and is most probably of European origin.

7. *CALTHA*, *Linn.*1. *CALTHA BIFLORA*, *DC.*, *Hook.*

HAB. Wet places near the Cascade Mountains, Oregon.—Stems slender, 1-2-flowered, usually bearing a single small leaf, but sometimes naked. Leaves reniform, conspicuously crenate, the radical ones on a long petiole, the basal sinus almost closed. Flowers about half as large as those of *C. palustris*, with oblong sepals; the 4-9 carpels slightly acuminate with the very short style. Sir William Hooker thought this species might be too nearly allied to *C. leptosepala*, DC.; but in these specimens it appears to be very distinct.

8. *TROLLIUS*, *Linn.*1. *TROLLIUS LAXUS*, *Salisb.*

HAB. Washington Territory; common in subalpine prairies near the Columbia River.—Smaller than the Eastern plant, but not otherwise to be distinguished.



9. COPTIS, *Salisb.*1. COPTIS OCCIDENTALIS, *Torr. & Gray.*

HAB. Woods, on the Umpqua Mountains, Oregon.—Upon this interesting and still rare plant Nuttall was disposed to found a genus, viz., *Chrysocoptis*, in Jour. Acad. Philad. 7, p. 9, t. 1. The present specimens are all in fruit; the petioles 8 or 10 inches long; peduncles about 6 inches, and the pedicels an inch or more in length. Follicles 4–6, somewhat curved, pointed with the very short persistent style.

10. AQUILEGIA, *Linn.*1. AQUILEGIA CANADENSIS, *Linn.*, var. FORMOSA.

HAB. Borders of Puget Sound, and along the Columbia River; also in the interior of Oregon.—This Columbine, the *A. formosa* of Fischer and Meyer, differs from the Eastern *A. Canadensis* in having the sepals nearly as long as the spurs, and twice the length of the limb of the petals. Intermediate forms seem to forbid its being recognized as a species.

11. DELPHINIUM, *Linn.*1. DELPHINIUM MENZIESII, *DC.*

HAB. Prairies and woods, Puget Sound and interior of Oregon.—Plant clothed with a short soft pubescence, somewhat branching. Leaves an inch and a half in diameter, with a reniform circumscription, 3-parted; the divisions 2- to 5-lobed, oblong or broadly linear. Raceme 5–12-flowered; the peduncles 1–2 inches long. Flowers large, pubescent. Sepals deep purplish-blue. Spur straight, longer than the limb. Upper petals yellowish; the lower nearly orbicular, moderately 2-lobed, bearded on the face. Follicles commonly 3, oblong, pubescent.

2. DELPHINIUM AZUREUM, *Michx.*

HAB. Okanagan River, and high plains along the Kooskooskee.—A variable species, extending southward through a great part of California, and eastward to the Southern Atlantic States.

3. DELPHINIUM SIMPLEX, *Hook.*

HAB. On the Spokane River, a tributary of the Upper Columbia.

12. ACONITUM, *Tourn.*1. ACONITUM NASUTUM, *Fisch.*

HAB. Moist and rich prairies of Washington Territory; widely diffused over the western part of the continent, and very variable.—It includes Nuttall's *A. Columbianum*, &c.

13. ACTÆA, *Linn.*1. ACTÆA SPICATA, *Linn.*, var. ARGUTA.

HAB. Dry and fertile woods; Nisqually, Fraser River, &c.; not rare in Oregon, and extending to California.—This is Nuttall's *A. arguta*, and is more nearly like the *A. spicata* of the Old World than is our *A. rubra*. The fruit, about the size of a large pea, appears to have been red, and is about 9-seeded. The uppermost leaf is closely sessile and three-parted to the base.

14. PÆONIA, *Linn.*1. PÆONIA BROWNII, *Dougl.*

HAB. Mountain-sides, interior of Washington Territory and Oregon,

extending to California. For Nuttall's *P. Californica* is the very same.—Plant about a foot high, somewhat succulent. Flowers an inch and a half in diameter. Petals roundish, somewhat leathery. This is interesting as being the only *Pæonia* of the New World.

*Crossosoma*, Nutt., a most remarkable Californian genus, which, in the Botany of Whipple's Expedition (where a good figure is given), was considered to be most allied to *Pæonia*, may rather more confidently be referred to that tribe now that ripe seeds are known, and the embryo is found to be fully half the length of a fleshy albumen. Although the arillus would technically refer the plant to the *Dilleniaceæ*, where it would be without any known relative whatever, this is counterbalanced by the fleshy perigynous disk which has its counterpart only in *Pæonia*.

---

## ORD. 2. BERBERIDACEÆ.

### 1. BERBERIS, *Linn.*

#### 1. BERBERIS AQUIFOLIUM, *Pursh.*

HAB. From Puget Sound to the Valley of the Sacramento, and, if we include *B. pinnata*, Lagasca (*Mahonia fascicularis*, DC.), into which it gradually passes, along the whole coast of California.

#### 2. BERBERIS NERVOSA, *Pursh.*

HAB. Deep woods around Puget Sound, and in similar stations down to California.—Rarely more than one or two feet high.

2. V A N C O U V E R I A, *Morr. & Decaisne.*1. V A N C O U V E R I A H E X A N D R A, *Morr. & Decaisne.*

HAB. Fertile woods about Puget Sound.—Fruit dehiscing, not by the sutures, but by a vertical separation of the dorsal from the ventral portion (as in *Diamorpha*), forming (from the gibbosity of the fruit) two unequal valves which are revolute and persistent. In the only unopened capsule there was but a single perfect seed, and eight abortive ones. Raphe inflated and arilliform.

3. A C H L Y S, *DC.*1. A C H L Y S T R I P H Y L L A, *DC.*

HAB. Fertile woods, Puget Sound, and Umpqua Mountains in Oregon. [The dehiscence of the carpel in this plant, otherwise well figured by Hooker, Fl. Bor.-Am. t. 12, is also anomalous. It is neither “bivalvatim dehiscens,” nor really dehiscent at all. The whole dorsal portion is almost cartilaginous; the ventral portion is thin, membranaceous, and strongly concave or cupped, with a fleshy central ridge, which when soaked, and probably in the fresh state, swells up very much and fills the cavity. This pulpy portion might be likened to the thickened placenta of *Podophyllum*, but it does not bear the seed. That rises from the very base of the cell. Vide Proceed. Am. Acad. 8, p. 376.]

### ORD. 3. NYMPHÆACEÆ.

#### 1. BRASENIA, *Schreber*. (HYDROPELTIS, *Michx.*)

##### 1. BRASENIA PELTATA, *Pursh*.

HAB. Satchap River, near its entrance into Gray's Harbor, Washington Territory.—Not hitherto known to occur west of Arkansas and Eastern Texas, although long known to inhabit Eastern Australia, Japan, and Khasia. [To which may now be added Angola, Western Africa; and two new stations on our Pacific coast, viz., in Oregon and in Clear Lake, California. But it was in this Expedition that the unexpected discovery of this plant on the Pacific coast was made. It was recorded in the Memoirs of the American Academy of Arts and Sciences, new series, 6, p. 449, in the year 1859.]

#### 2. NUPHAR, *Smith*.

##### 1. NUPHAR ADVENA, *Ait.*

HAB. Borders of the Kooskooskee River, Washington Territory, and near San Francisco, California. [Most probably *N. polysepalum*, Engelm., in Trans. Acad. Sci. St. Louis.]

## ORD. 4. SARRACENIACEÆ.

### 1. DARLINGTONIA, Torr.

*Calyx ebracteolatus, 5-sepalus; sepalis distinctis subpetaloideis. Corolla 5-petala; petalis latissime unguiculatis; lamina ovata ungue multo minore. Stamina 12-15, uniserialia; filamentis brevibus subulatis; antheris oblongo-linearibus, loculis inæqualibus. Ovarium turbinatum, 5-loculare, 5-lobatum, apice dilatatum, concavum. Stylus brevis, columnaris, 5-fidus; laciniis linearibus divergentibus, apice intus stigmatosis. Ovula plurima anatropa, placentas dilatatas obtegentia. Capsula . . . . . Herba perennis, Californica, uliginosa; foliis fere Sarracenie, lamina profunde biloba, lobis divergentibus; scapis unifloris bracteatis; bracteis infimis distantibus, supremis approximatis imbricatis; flore nutante purpureo.*

### 1. DARLINGTONIA CALIFORNICA, Torr.

*Darlingtonia Californica*, Torr. in Smithson. Contrib. 6, p. 4.

HAB. Head-waters of the Sacramento, in Northern California, near the Shasta Mountain, growing in marshes. Mr. Brackenridge (who found only the leaves and scapes, but neither flower nor fruit). Near the same place it was long afterwards found in flower by Dr. G. W. Hulse.

A perennial herb. Rootstock short and thick, producing numerous, stout, dark-brown, fibrous roots. Leaves all radical; the adult ones from eighteen inches to two feet or more in length; the petiole or pitcher tubular, gradually tapering downward, and singularly twisted on its axis about half a turn, marked with strong parallel longitudinal veins, which are connected by very slender veinlets. The summit

is vaulted, and formed into a sac, which (in the full-grown leaf) is about the size of a hen's egg, on the other side of which is an oval orifice, about an inch in diameter, opening into the cavity of the pitcher. The areolæ of the sac, and also of the back of the tube on the upper part, are discolored (of a dull orange color in the dried specimens), as in *Sarracenia variolaris* and *S. Drummondii*. Along the inside of the petiole is a narrow wing, which is single, except at the base, where it separates into two plates that clasp the scape and the base of the superior leaves. The lamina is narrow at the base, and deeply divided into two somewhat unequal widely spreading lobes, which are oblong-lanceolate, rather acute, bent downwards and often also backwards; the inner (or properly upper) surface very minutely pubescent. The pitcher, inside the hood, is retrorsely hirsute with short conical hairs; from thence downwards it is glabrous, except towards the bottom, where it is lined with slender hairs, also pointing downward: at the bottom the remains of insects were found. Neither these hairs nor those of the lamina appear to be of a secreting character. They are almost precisely similar to those of the leaves of *Sarracenia*.\* The scape is from one to four feet long, flexuous, angular, glabrous, and furnished with sessile clasping straw-colored scales. These scales are foliaceous and alternate, the lower ones distant and lanceolate, the upper more and more approximated and broader, while those near the flower are oblong-ovate and imbricate. They are marked with longitudinal veins, which are forked toward the extremity. The upper surface is paler, and under a lens shows minute conical papillæ. The flower, when fully expanded, is nearly two inches in diameter. The calyx consists of five oblong rather acute sepals, which are of a pale straw color, and are quincuncially imbricated. There are no calyculate bracts at their base. The corolla is 5-petalled, about the length of the calyx, and its æstivation is likewise quincuncial. The petals are oblong, pale purple, marked with deeper reticulated veins, and are apparently not connivent over the pistil. They are furnished with a small ovate lamina, and very broad obovate claw, which is two or three times longer than the lamina. Stamens 12-15, hypogynous, in a single series, and partly concealed by the dilated summit of the ovary: filaments short and rather stout: anthers oblong, with the cells very unequal, and opening longitudi-

\* See Torr. Fl. New York, 1, p. 42.

nally, turned by the twisting of the filaments so that the cells are anterior and posterior, the smaller cell lying against the ovary. Pollen simple and spherical. Ovary turbinate, 5-celled, and somewhat 5-lobed, concave and dilated at the summit, so as to form a sort of margin which projects over the stamens: style columnar, short, 5-lobed at the summit; the narrow segments diverging, and stigmatose at the extremity on the inside. Ovules very numerous, anatropous, covering the large placentæ, which project into the cells of the ovary. No fruit was found, but on one of the specimens there was a small portion of a capsule, which was evidently 5-celled.

From *Sarracenia* this genus differs in the calyx not being calyculate; in the form of the petals; in the somewhat definite and uniserial stamens; in the dilated turbinate ovary; and especially in the absence of the large umbrella-shaped summit of the style, which is so conspicuous in the former genus. The forked lamina of the leaf, and the bracteate scapes, are also characters not found in any *Sarracenia*. From *Heliamphora* it is still more distinct. In that genus the scapes are several-flowered; the flowers are apetalous; the style is entire and not dilated at the summit, and the ovary is 3-celled. The leaves also differ in their greatly dilated orifice, very small lamina, and doubly winged pitchers.

In the Bibliothèque Universelle de Genève, Archives des Sciences Physiques et Naturelles, 1854, p. 255, are some observations on this genus, by Alph. De Candolle. He points out a remarkable character in Mr. Sprague's admirable figure, which I have not mentioned in my description, viz., that the five cells of the ovary are represented as alternate with the sepals, while in *Sarracenia purpurea* they are opposite. Contrary symmetries are rare in nearly allied genera, but M. De Candolle has discovered some such among *Campanulaceæ*. He nevertheless inquires whether Mr. Sprague may not have mistaken the structure of *Darlingtonia* in this particular. Although I am unwilling to sacrifice my only remaining flower of this plant, the fragment of a capsule on one of the specimens of the Exploring Expedition enables me to verify the correctness of Mr. Sprague's analysis. The axis, with portions of the dissepiment, and the bases of the sepals remain, and the cells are alternate with the sepals.

[This plant,—one of the most interesting botanical discoveries of the Expedition,—has been brought into cultivation since the above was written, and has been more than once illustrated. It is none the



less desirable, on this account, that the original description should appear. It ought also to be here mentioned that the genus in its name commemorates one of the worthiest American botanists of the last generation, Dr. William Darlington, of West Chester, Pennsylvania, author of the *Flora Cestricea*, &c., who survived in a good old age to see and admire this wonderful plant.]

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## ORD. 5. PAPAVERACEÆ.

### 1. ESCHSCHOLTZIA, *Cham.*

#### 1. ESCHSCHOLTZIA CALIFORNICA, *Cham.*

HAB. Near San Francisco, and in other parts of California: common.

#### 2. ESCHSCHOLTZIA DOUGLASII, *Hook. & Arn.*

HAB. On the Willamette River, Oregon, and from thence to the Sacramento Valley, California.—We suspect this is not distinct from *E. Californica*.

### 2. DENDROMECON, *Benth.*

#### 1. DENDROMECON RIGIDUM, *Benth.*

HAB. Near San Francisco, and on the Upper Sacramento, California.—A shrub, usually not more than three feet high, with a smooth, polished stem.

## ORD. 6. FUMARIACEÆ.

### 1. DICENTRA, *Borck.*

#### 1. DICENTRA FORMOSA, *DC.*

*Dielytra formosa*, DC. Syst. 2, p. 109; Hook. Fl. Bor.-Am. 1, p. 35.

*D. saccata*, Nutt., in Torr. & Gray, Fl. 1, p. 67.

*Fumaria formosa*, Dryand. in Hort. Kew. (ed. 2), 4, p. 239; Bot. Mag. t. 1335.

HAB. Fertile woods, Puget Sound; common.—This species is very closely allied to *D. eximia*, but the racemes are much less compound, and the flowers are considerably broader across the spurs.

#### 2. DICENTRA CUCULLARIA, *DC.*

HAB. Plains, and on the north side of hills, in the Nez Percé country; flowering in March; Rev. Mr. Spalding.

### 2. CORYDALIS, *Vent.*

#### 1. CORYDALIS AUREA, *Willd.*

HAB. In the Nez Percé country; Rev. Mr. Spalding. [This Western plant is the var. *occidentalis* or *C. montana* of Engelmann, as indicated in Gray, Man. ed. 5, p. 62.]

## ORD. 7. CRUCIFERÆ.

### 1. NASTURTIUM, *R. Br.*

#### 1. NASTURTIUM PALUSTRE, *DC.*

HAB. Wet grounds, Oregon and California; common all round the northern hemisphere.

#### 2. NASTURTIUM CURVISILIQUA, *Nutt.*

HAB. Shady wet places in the Nez Percé country, Rev. Mr. Spalding. The siliques are not mature, but the plant agrees very well with original specimens of this species received from Mr. Nuttall.

#### 3. NASTURTIUM LYRATUM, *Nutt.*

HAB. Damp soils on the Upper Sacramento, California.—Our specimens differ from Nuttall's in the leaves being only coarsely toothed, instead of lyrate or pinnatifid with toothed segments.

### 2. BARBAREA, *R. Br.*

#### 1. BARBAREA VULGARIS, *R. Br.*

HAB. Moist places, Puget Sound; and along watercourses in the Nez Percé country. On the Satchap River, Washington Territory. The latter one of the forms commonly referred to *B. præcox*, *R. Br.*

3. STREPTANTHUS, *Nutt.*1. STREPTANTHUS TORTUOSUS, *Kellogg.*

HAB. Mountainous region in the upper part of the valley of the Sacramento, California; among loose rocks.—Root biennial. Stem 2 or 3 feet high, with a few erect branches. Leaves thick, and apparently somewhat fleshy; the radical ones about 2 inches long, narrowed at the base; the cauline numerous and approximated, an inch in length, with a very deep sinus at the base. Sepals ovate-oblong, obtuse, hairy at the tip externally. Petals narrowly rhomboid-lanceolate, undulate, greenish? with purple veins, nearly twice the length of the calyx. Pod 2 inches or more in length, less than 2 lines wide, falcate, curved downwards. Seeds with a narrow margin on the radicular side. [This was not unnaturally thought to be *S. cordatus* of Nuttall, and is the plant so named by Torrey in Whipple's Expedition. It was set right in the monograph of *Streptanthus*, and the true *S. cordatus* of Nuttall has since been elucidated by S. Watson in the Botany of King's Exploration.]

4. TURRITIS, *Dill.*1. TURRITIS MACROCARPA, *Nutt. in Torr. & Gray.*

HAB. Nisqually, Puget Sound: not uncommon.—Too near *Turritis glabra*, which it represents on the Pacific coast.

2. TURRITIS PATULA, *Graham.*

HAB. Interior of Oregon and Washington Territory; a species of wide range and diverse forms, some of them apparently passing into the next.

3. *TURRITIS RETROFRACTA*, *Hook.*

HAB. On the Upper Columbia, between Fort Okanagan and Grand Couleé; and shady banks of the Kooskooskee, Rev. Mr. Spalding.

5. *ARABIS*, *Linn.*1. *ARABIS HIRSUTA*, *Scop.*

HAB. Puget Sound and Gray's Harbor; also in the interior of Oregon.

2. *ARABIS RUPESTRIS*, *Nutt. in Torr. & Gray.*

HAB. Nisqually, Puget Sound.—Very near *A. hirsuta*.

3. *ARABIS LÆVIGATA*, *DC.*

HAB. Sides of the Cascade Mountains, Washington Territory.—Flowers considerably larger than in the ordinary state of the plant.

4. *ARABIS CANESCENS*, *Nutt. in Torr. & Gray.*

HAB. On the Upper Columbia, and in the interior of Oregon.

6. *CARDAMINE*, *Linn.*1. *CARDAMINE ANGULATA*, *Hook.*

HAB. Fertile, moist woods, Nisqually, Puget Sound; also, near the Cascade Mountains, Oregon, with the stem and upper leaves pubescent.

2. *CARDAMINE CORDIFOLIA*, Gray, *Pl. Fendl.*

HAB. Near the Cascade Mountains, Washington Territory.—Our solitary specimen agrees well with the plant of Fendler from the mountains of New Mexico. We have it also in fruit from Fremont, collected in his third expedition, on the head-waters of the Arkansas. It most resembles *C. rhomboidea*, but differs in the leaves being all cordate and petioled, in its shorter and stouter fructiferous pedicels, and in the much less pointed pods. [Lyll and E. Hall have since collected it in Oregon, verifying the species.]

3. *CARDAMINE HIRSUTA*, Linn.

HAB. Puget Sound, Washington Territory; the common and widely diffused species.

4. *CARDAMINE OLIGOSPERMA*, Nutt., *l. c.*

HAB. Puget Sound.—Evidently a distinct species, near the last.

7. *DENTARIA*, Linn.1. *DENTARIA TENELLA*, Pursh.

HAB. Nisqually, Puget Sound.—The segments of the leaves vary from oblong to broadly linear. The pod is an inch long, and more than an inch wide, acuminate with the tapering style.

8. *PHŒNICAULIS*, Nutt.1. *PHŒNICAULIS CHEIRANTHOIDES*, Nutt. in Torr. & Gray.

HAB. On the Upper Columbia, Washington Territory.—[Genus reduced to *Cheiranthus*, i. e., *C. Menziesii*, Benth. & Hook.]

9. SISYMBRIUM, *Allioni*.1. SISYMBRIUM SOPHIA, *Linn.*, vars.

HAB. On the Upper Columbia River.—[Two forms; one clearly belonging to *S. incisum*, Engelm.; the other, with pedicels only twice the length of the calyx and only half as long as the pod, would appear to be Fournier's *S. Hartwegianum*.]

2. SISYMBRIUM THALIANA, *Gay*.

HAB. Dry prairies between Fort Okanagan and Grand Coulé.—Probably indigenous to the region.

10. ERYSIMUM, *Linn.*1. ERYSIMUM CHEIRANTHOIDES, *Linn.*

HAB. Interior of Oregon.—Evidently an indigenous species.

2. ERYSIMUM ASPERUM, *DC.*

HAB. Puget Sound, and prairies in the interior of Washington Territory. [*E. lanceolatum*, Pursh.]

3. ERYSIMUM RETROFRACTUM, *Sp. Nov.*

*E. glabrum, elatum; foliis inferioribus lyratis, superioribus oblongo-lanceolatis remote runcinato-dentatis; floribus minutis; siliquis longe racemosis brevi-pedicellatis reflexis acutis.*

HAB. Between the Cascade Mountains and Fort Nisqually; rare.—A remarkable species, easily distinguished by its smoothness and reflexed siliques. The stem is 3 or 4 feet high. The leaves with a long tapering point; lower cauline ones 2 or 3 inches long. Flowers

smaller than in *E. cheiranthoides*. Petals obovate-cuneate, scarcely longer than the calyx. Pedicels of the fruit 2 to 3 lines long, a little hairy, abruptly bent downward. Pods an inch and a half long, and nearly a line wide, distinctly quadrangular. Stigma minute. Seeds in a single row, oblong. Cotyledons incumbent. [This needs to be compared with *Sisymbrium deflexum* of Harvey, which is also *Turritis? lasiophylla*, Hook. & Arn., and which, in a form having less pinnatifid leaves, extends into Oregon.]

# 11. THELYPODIUM, Endl. (PACHYPODIUM, Nutt.)

## 1. THELYPODIUM LACINIATUM, Endl.

HAB. On the Columbia and Kooskooskee Rivers.—The mature pods are three inches or more in length, in an elongated raceme.

## 2. THELYPODIUM BRACHYCARPUM, Sp. Nov. (Tab. 1.)

*T. foliis radicalibus lyrato-pinnatifidis, caulinis lanceolato-oblongis basi sagittatis amplexicaulibus integerrimis; racemis spiciformibus, floribus subsessilibus; petalis calyce 2-3-plo longioribus anguste linearibus; siliquis oblongo-linearibus; stipite brevissimo.*

HAB. On the Klamet River, southern borders of Oregon.—Whole plant smooth. Root biennial. Stem 2 or 3 feet high, fastigiately branched. Radical leaves about 2 inches long; the lobes somewhat toothed: cauline leaves acute or obtuse, an inch long, apparently rather fleshy; the auricles rounded. Pedicels scarcely a line in length. Sepals oblong. Petals white, extremely narrow and of nearly uniform breadth throughout, apparently twisted. Pods in a short close raceme, 6 to 9 lines long, nearly terete, somewhat torulose, abruptly pointed with the very short style. Seeds 6 to 9 in each cell, oblong, not margined. Cotyledons obliquely incumbent. A well-marked species, resembling *T. laciniatum* in its very long narrow petals, and *P. sagittatum* in its leaves; but differing from both in its short almost sessile pods.



PLATE 1.—THELYPODIUM BRACHYCARPUM. An entire plant of the natural size. Fig. 1. Plan of the flower. 2. A flower partly expanded. 3. A petal from the same. 4. A stamen from the same. 5. A flower fully expanded. 6. A sepal from the same. 7. A petal. 8. One of the longer stamens. 9. One of the shorter stamens. 10. The pistil, with the glands at its base. 11. One of the glands. 12. A branch bearing ripe pods. 13. Tissue of the partition. 14. A little of the same, more magnified. 15. A seed transversely divided. 16. The embryo. All the details more or less magnified.

## 12. VESICARIA, *Lam.*

### 1. VESICARIA LUDOVICIANA, *DC.*

HAB. Sandy banks of the Columbia River.—The specimens are unusually tall, some of them being a foot and a half high.

## 13. PHYSARIA, *Gray.*

### 1. PHYSARIA DIDYMOCARPA, *Gray.*

HAB. Banks of rivers; interior of Oregon, widely distributed throughout the dry central regions of the continent.

### 2. PHYSARIA GEYERI, *Gray.*

HAB. Prairies along the Columbia River, between Spokane River and Fort Colville, interior of Oregon.—A very distinct species, well described and figured by Hooker. The pods are scarcely one-fourth the size of those of *P. didymocarpa*. As these species (to which a third, *P. Newberryi*, has been added) have only the aspect, and not the carpological character, of *Vesicaria*, the genus would seem to be a good one.

14. DRABA, *Linn.*1. DRABA NEMOROSA, *Linn.*

HAB. Port Discovery, Puget Sound (var. *hebecarpa*); mountains of Oregon (specimens without fruit).

2. DRABA CAROLINIANA, *Walt.*

HAB. On the Columbia River, near Fort Walla-Walla.—A widely diffused species east of the Mississippi, but no station west of the Rocky Mountains has been hitherto recorded.

15. THLASPI, *Dill.*1. THLASPI COCHLEARIFORME, *DC.*

HAB. Interior of Oregon.—Plant nearly a foot high, branching from the base. Raceme elongated in fruit. Pedicels about twice the length of the mature pods. Cells of the pod 4–7-seeded. Our plant seems to be hardly distinct from *T. alpestris*, and it clearly includes *T. Fendleri*, Gray.

16. LEPIDIUM, *Linn., R. Br.*1. LEPIDIUM RUDERALE, *Linn.*

HAB. Valley of the Columbia River.—The pods are somewhat scabrous-pubescent; especially on the margin. [Probably *L. intermedium*, Gray, Pl. Wright., which is the common Western species.]

2. LEPIDIUM MENZIESII, *DC.*

HAB. In various parts of Washington Territory, commonly near the sea.—The leaves are variable: sometimes all of them nearly

entire, or with a few sharp teeth; sometimes deeply pinnatifid, with the lobes 2-3-toothed. Petals 4, two of them broader than the others. Stamens often only 3. Pods smooth. Cotyledons incumbent.

17. CAPSELLA, *Vent.*

1. CAPSELLA BURSA-PASTORIS, *Mench.*

HAB. Around Fort Nisqually, Puget Sound, and in the interior of the country: probably introduced from Europe.

18. PLATYSPERMUM, *Hook.*

1. PLATYSPERMUM SCAPIGERUM, *Hook.*

HAB. Stony land on the Kooskooskee River; flowering in January. The fructiferous scapes are from 4 to 5 inches high. Pods broadly oval, nearly half an inch in length; the valves reticulated: dissepiment very thin and translucent, without a longitudinal line; the tubuli reticulated, forming minute transversely oblong areolæ. Seeds mostly 4 in each cell, surrounded with a very broad orbicular membrane: funiculi free. This interesting little plant, so well illustrated by Hooker, is of rare occurrence in collections.

19. THYSANOCARPUS, *Hook.*

1. THYSANOCARPUS CURVIPES, *Hook.*

HAB. Puget Sound; extending south through California.

2. THYSANOCARPUS OBLONGIFOLIUS, *Nutt. in Torr. & Gray.*

HAB. Puget Sound, and low grounds on the Kooskooskee River.

## ORD. 8. CAPPARIDACEÆ.

### 1. CLEOME, *Linn.*

#### 1. CLEOME (PERITOMA) PLATYCARPA, Sp. Nov. (Tab. 2.)

*C. pilis patentibus partim glandulosis pubescens; foliis trifoliolatis; foliolis oblongo-lanceolatis utrinque acutiusculis integerrimis; sepalis basi connatis lineari-lanceolatis; petalis (luteis) oblongo-obovatis vix unguiculatis; staminibus subæqualibus; siliquis late oblongis dense pubescentibus stipite vix æqualibus stylo longo persistente superatis.*

HAB. Klamet River, Northern California.

Annual. Stem about a foot high, somewhat branching. Pubescence of two kinds; one shorter, grayish, and consisting of simple hairs; the other twice as long, the hairs stouter, yellowish, and partly glandular. Leaves all trifoliolate; the leaflets 6 to 8 lines long, and pubescent on both sides. Flowers in a terminal raceme which is elongated in fruit. Sepals distinct nearly to the base, tapering to a long subulate point, nearly half the length of the petals, ciliate-serrulate on the margin. Petals about one-third of an inch long, obtuse, furnished with a very short claw. Stamens 6, a little unequal: filaments filiform, about twice the length of the petals, smooth: anthers linear-oblong, homomorphous, revolute when dry. Torus very short, bearing a minute fleshy nectary. Ovary supported on a long slender stipe, oblong, densely pubescent, abruptly pointed with a style, which is one-third the length of the ovary itself. Pod three-fourths of an inch long, and about 4 lines broad, compressed, 10–12-seeded, rather obtuse at each end; the persistent style nearly three lines long; the valves separating from the filiform placentæ.—This is a very distinct species, but allied to *C. lutea*, from which it differs in its trifoliolate

leaves, very broad pod, and conspicuous style, as well as in its pubescence.

PLATE 2.—CLEOME PLATYCARPA. Upper part of the plant. Fig. 1. An unexpanded flower. 5. Stamens from the same. 2. An expanded flower. 3. A sepal. 4. A petal. 6. A stamen. 7. Upper part of the same, showing the form of the anther after discharging its pollen. 8. The pistil. 9. Replum and seeds of a mature pod. 10. A seed. 11. The same longitudinally divided. Details more or less magnified.

## 2. CLEOME LUTEA, Hook.

HAB. Rich soil, on hillsides, Kooskooskee River, flowering in May and June: also on the Walla-Walla River.—This includes *C. aurea*, Nutt., in Torr. & Gray, Fl. At least I find no sufficient characters for distinguishing *C. aurea* from *C. lutea*. In both the stamens are nearly equal when the flowers are fully expanded, but in some of the buds of my specimen of the latter, one or two of the stamens are shorter than the others, as represented in the figure of Hooker. More rarely there are four short and two long stamens, as they are described in the text of the same work. As to the relative length of the pod and styles, there is no constancy. The ovary in some of the flowers is reduced to a mere rudiment.

## 2. POLANISIA, Raf.

### 1. POLANISIA GRAVEOLENS, Raf.

HAB. On the Walla-Walla, Oregon; June, in flower and fruit.—So far as we know, this plant has not before been detected west of the Rocky Mountains.

## ORD. 9. VIOLACEÆ.

### 1. VIOLA, *Linn.*

#### 1. VIOLA SARMENTOSA, *Dougl.*

HAB. Puget Sound and Cascade Mountains, Washington Territory.—A small form of a species which is common through the region, and which in Sir William Hooker's account of Geyer's plants was doubtfully referred to *V. rotundifolia*.

#### 2. VIOLA CUCULLATA, *Ait.*

HAB. Washington Territory; near rivers.—Agrees with the eastern species.

#### 3. VIOLA GLABELLA, *Nutt.*

HAB. Puget Sound, and plains towards the Cascade Mountains.—A slender species, about 6 inches high, with thin leaves and bright yellow flowers.

#### 4. VIOLA NUTTALLII, *Pursh.*

HAB. In prairies; Puget Sound; Vancouver; and Kooskooskee River.—Includes *V. præmorsa*, Dougl., *V. linguæfolia*, Nutt., and probably *V. pedunculata*, Torr. & Gray, as a large-flowered form.

5. *VIOLA ADUNCA*, *Smith*.

HAB. Woods; Puget Sound, and Gray's Harbor, Washington Territory.—Specimens of what seems to be this species (also *V. longipes*, Nutt.), with all the flowers small and apetalous, were gathered on the Spokane River.

6. *VIOLA CHRYSANTHA*, *Hook*.

*Viola chrysantha*, Hook. Ic. t. 49; Torr. & Gray, Fl. 1, p. 143.

Var. GLABERRIMA: *foliis pedatim 3-5-partitis, segmentis profunde 2-7-lobis, lobis lanceolatis integris.*

HAB. High, dry prairies between the Spipen River and the Columbia.—A remarkable variety, found only in the station here recorded. The divisions of the leaves are said by Dr. Pickering, in his notes, to be "curved upward, and not growing in one plane." The flowers resemble those of the ordinary state of this species, the upper petals being purplish and the others yellow.

[From the habitat and the character, this may be inferred to be the *Viola Hallii*, Gray, recently published in the Proceedings of the American Academy of Arts and Sciences, 8, p. 337.]

## ORD. 10. CISTACEÆ.

### 1. HELIANTHEMUM, *Tourn.*

#### 1. HELIANTHEMUM SCOPARIUM, *Nutt. in Torr. & Gray.*

HAB. Sides of Mount Palmas near San Francisco, California, in gravelly places.—This species is certainly annual, and not shrubby, as stated by Hooker and Arnott in the Botany of Beechey's Voyage (p. 135). The plant has much the appearance of *Hypericum Drummondii*.

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## ORD. 11. HYPERICACEÆ.

### 1. HYPERICUM, *Linn.*

#### 1. HYPERICUM FORMOSUM, *H. B. K.*

*Hypericum formosum*, H. B. K. Nov. Gen. & Spec. 5, p. 196, t. 160; DC. Prodr. 1, p. 547; Gray, Pl. Wright. 2, p. 17.

*H. Scouleri*, Hook. Fl. Bor.-Am. 1, p. 111; Torr. & Gray, Fl. 1, p. 160.

*H. bracteosum*, Kellogg in Proceed. Calif. Acad. Nat. Sc. 1, p. 65.

HAB. Near Nisqually, and on the Wallah-Wallah and Kooskooskee Rivers, Washington Territory and Oregon, southward to California and New Mexico.

As remarked by Dr. Gray (l. c.), *H. formosum* of Kunth differs but little from *H. Scouleri*, and he suspected they were not distinct. If, as we believe, the New Mexican plant is the same as Kunth's, *H. Scouleri* must be united with it.



2. *HYPERICUM CONCINNUM*, *Benth, Pl. Hartw.*

HAB. Sides of Mount Palmas, California; in gravelly places.—A well-characterized species, of which I have excellent specimens collected by Col. Fremont, in California, in 1846. I have received it also from the Rev. A. Fitch, and from the late Mr. Shelton. In all my specimens the leaves are narrowly lanceolate-linear, and sparingly pellucid-punctate, in which characters they differ somewhat from the description of Benthams. The flowers are large for the size of the plant. Stamens 40 to 50. Styles very long and somewhat spreading. Capsule 3-lobed, 3-celled. Seeds narrowly cylindrical.

3. *HYPERICUM ANAGALLOIDES*, *Cham. & Schlecht.*

HAB. Near San Francisco, California; common on the western coast.—A small species, nearly allied to *H. mutilum*. The capsule is ovate-conical, one-celled, with 3 parietal placentæ. Seeds rather large, cylindrical-oblong.

## O R D. 12. F R A N K E N I A C E Æ.

1. F R A N K E N I A, *Linn.*1. *FRANKENIA GRANDIFOLIA*, *Cham. & Schlecht.*

*Frankenia grandifolia*, Cham. & Schlecht. in Linnæa, 1, p. 35; Hook. & Arn. Bot. Beech. Voy., p. 135; Presl, Rel. Haenk. 2, p. 3; Torr. & Gray, Fl. 1, p. 168; Torr. Bot. Mex. Bound. Surv. p. 36, t. 5.

HAB. Saline Plains, California, on the Upper Sacramento, and in salt marshes, near San Francisco.

## ORD. 13. CARYOPHYLLACEÆ.

### 1. SILENE, *Linn.*

#### 1. SILENE ANTIRRHINA, *Linn.*

HAB. Mouth of the Spokane River, and on the Kooskooskee; also near San Francisco, almost as common on the western as on the eastern side of the continent.

#### 2. SILENE DOUGLASHI, *Hook.*

HAB. Vicinity of Fort Nisqually, Puget Sound, and on the Okanagan River.—Flowers few, in a loose terminal cyme. Calyx somewhat veiny; the teeth obtuse, with a membranous ciliolate border. Limb of the petals 2-cleft about half its length; the divisions linear-oblong, mostly entire, but sometimes emarginate.

#### 3. SILENE SCOULERI, *Hook.*

HAB. From Puget Sound, eastward to the Cascade Mountains.—Root perennial. Stems  $1\frac{1}{2}$  to 2 feet high, swollen at the nodes, minutely pubescent. Leaves lanceolate-linear, 2–3 inches long. Flowers in a narrow cymose panicle; peduncles mostly opposite, 1–3-flowered. Calyx oblong-clavate, abruptly contracted at the base; the teeth broadly ovate, with a membranaceous ciliolate border. Petals apparently pale rose color; the limb deeply 2-parted; the divisions more or less deeply 2-cleft, with narrow lobes, which are either entire or emarginate. Besides the primary divisions, there are often two shorter and narrower lateral segments which are situated lower down than the others.

4. *SILENE MENZIESII*, Hook.

HAB. In woods between the Cascade Mountains and the Columbia River.—The specimens confirm the opinion given in the supplement of the Flora of North America, that *S. Menziesii* and *S. stellaroides* are one species. Hooker states that the petals are destitute of a crown, which is a mistake.

5. *SILENE CALIFORNICA*, Durand.

*Silene Californica*, Durand, Pl. Pratt. in Jour. Acad. Phil. (n. ser.) 2, p. 83; Torr. in Bot. Whipl. Rep. p. 69.  
*S. Virginica*, Benth. Pl. Hartw. p. 299, excl. syn.

HAB. Valley of the Upper Sacramento, California.—This differs in some respects from the plant of Durand and of Whipple, but not very essentially. Leaves obovate-oblong, acuminate, the uppermost sessile and somewhat clasping. Cyme few-flowered. Calyx oblong-cylindrical, in fruit ovate and somewhat inflated; the teeth oblong-lanceolate, acute. Petals scarlet, 4-cleft; the lateral segments much narrower than the others; middle segments emarginate: near the base of the limb on each side is an acute salient tooth. The crown 2-parted, with the divisions 2-3-toothed. Perhaps this plant is only a form of *S. laciniata*, Cavan., to which *Lychnis pulchra*, Cham. & Schlecht., almost certainly belongs. We have specimens of *S. pulchra* from Coulter's Mexican collection (No. 723), some of which have broadly ovate leaves which are more than an inch broad. Characters derived from the notches and teeth of the petals are variable, and cannot, therefore, be trusted for specific characters. Possibly *S. Virginica*, *S. regia*, and *S. rotundifolia*, are only varieties of *S. laciniata*.

2. *SAGINA*, Linn.1. *SAGINA PROCUMBENS*, Linn.

HAB. Puget Sound; apparently indigenous. (Parts of the flower five in all the specimens examined.)

## 2. SAGINA LINNÆI, Presl.

HAB. Nisqually, Puget Sound; also near Gray's Harbor. (Stamens sometimes only from 7 to 9.)

## 3. ALSINE, Wahl., Fenzl.

## 1. ALSINE TENELLA, Nutt. in Torr. &amp; Gray.

HAB. Puget Sound.—Probably, as Fenzl supposes, only an American variety of *A. tenuifolia*, Crantz.

## 4. ARENARIA, Linn.

## 1. ARENARIA CONGESTA, Nutt.

*Arenaria congesta*, Nutt. in Torr. & Gray, Fl. 1, p. 178.

HAB. On the Columbia River and its tributaries.—Stems 1 to 2 feet high, straight, compressed. Radical leaves sometimes 3 or 4 inches long; stem leaves shorter, erect. Heads of flowers about three-fourths of an inch long; the bracts finally rigid and pungent.

## 2. ARENARIA FORMOSA, Fisch.

HAB. Prairies between the Cascade Mountains and the Upper Columbia.—The upper part of the stem, as well as the peduncles and sepals, are glandularly pubescent. The radical leaves are more than an inch in length; those of the young shoots much crowded and curved; the mucronation either curved or straight. Sepals broadly ovate, membranaceous, and very obscurely 3-nerved. Capsule globose-ovate. Perhaps distinct from Fischer and Ledebour's plant, but it is pretty certainly *A. nardifolia* of Hooker.

3. *ARENARIA LARICIFOLIA*, Linn.

Var. *CÆSPITOSA*: *caulibus foliisque viscoso-puberulis; sepalis acutiusculis, nervo medio latissimo.*

HAB. Upper Columbia River, Washington Territory.—Perennial. Stems somewhat woody below, throwing up numerous erect rigid branches, which are about a span high, minutely and somewhat glandularly pubescent. Lower leaves closely approximated, and appearing fasciculate, erect; the uppermost distant, all of them narrowly subulate, rigid, and somewhat pungent, about an inch long. Cymes few-flowered, rather contracted. Sepals ovate, with a broad thin margin; the central part thick, nerveless, and resembling a broad midrib. Petals obovate, nearly twice as long as the sepals. Capsule ovate, very obtuse, a little shorter than the calyx; the valves 2-cleft at the summit. This is near the last species, but differs in the shorter and pubescent leaves, compound cymes, and acutish sepals. From *A. laricifolia* it differs in its longer leaves, much smaller and more numerous flowers, broader nerveless sepals, &c.

4. *ARENARIA FRANKLINI*, Dougl. in Hook.

HAB. Banks of the Columbia, above the mouth of the Wallah-Wallah, and on the Okanagan River.

5. *HONKENYA*, Ehrh.1. *HONKENYA PEPOIDES*, Ehrh.

HAB. Shores of Puget Sound, and Straits of De Fuca; also at Gray's Harbor, which is the most southern station known to us on the Pacific coast for this plant.—The specimens of this collection show a transition from *H. oblongifolia* to the ordinary form of *H. peploides*, and we now believe, with Ledebour, that there is but one species of the genus.

6. STELLARIA, *Linn.*1. STELLARIA LONGIFOLIA, *Muhl.*

HAB. Interior of Oregon.—The leaves of the solitary specimen are broader than usual.

2. STELLARIA NITENS, *Nutt. in Torr. & Gray.*

HAB. In prairies, Puget Sound; common. Also in the Kooskooskee, in the interior of Washington Territory. (Some of the specimens are 8 or 10 inches high.)

3. STELLARIA JAMESII, *Torr.*

HAB. Eastern slope of the Cascade Mountains, Washington Territory.—This differs from the plant collected by Dr. James only in the smaller leaves. The cymes are terminal and axillary. Petals 2-lobed only at the summit. It is allied to *S. holostea*.

4. STELLARIA BOREALIS, *Bigel.* & var. CRISPA.

HAB. On the Kooskooskee River, Rev. Mr. Spalding. Also near Gray's Harbor; the var. *crispa*, also growing at the latter place.—We unite *S. crispa* of Chamisso and Schlechtendal with *S. borealis*, because we find intermediate forms that connect them. The leaves of the former are sometimes evidently veiny, with an intramarginal nerve.

5. STELLARIA LONGIPES, *Goldie.*

HAB. Damp fertile soils, near Gray's Harbor and around Puget Sound. On the Kooskooskee River, Rev. Mr. Spalding.—This species, which is diffused over the northern part of this continent (from lat.

40°), is remarkably polymorphous, but is commonly identified with care. Its erect habit, shiny and somewhat rigid leaves, and dark-colored glossy elongated capsule, are characters which belong to all its forms.

## 7. CERASTIUM, *Linn.*

### 1. CERASTIUM ARVENSE, *Linn.*

HAB. Puget Sound, and on the Kooskooskee River.—A dwarf state of this species, with numerous cespitose viscidly pubescent stems, and short crowded leaves, was collected about Puget Sound.

## 8. MÆHRINGIA, *Linn.*

### 1. MÆHRINGIA LATERIFLORA, *Fenzl.*

HAB. Damp fertile places on the Kooskooskee River; Rev. Mr. Spalding.

### 2. MÆHRINGIA MACROPHYLLA.

*Mæhringia umbrosa*, Fenzl. in Ledeb. Fl. Ross. 1, p. 372; Gray, Pl. Fendl. p. 13.  
*Arenaria macrophylla*, Hook., Fl. Bor.-Am. 1, p. 102, t. 37; Torr. & Gray, Fl. 1, p. 182; Torr. Bot. Whipl. Rep. p. 69.  
*A. umbrosa*, Ledeb. Ic. Pl. Fl. Ross, t. 322.

HAB. Puget Sound, Washington Territory.—In the Flora of North America (l. c.) it was stated that *Arenaria macrophylla*, Hook., was very near *A. umbrosa*, of Fenzl. There is now scarcely a doubt of their identity. In removing the plant to the genus *Mæhringia* we adopt the earlier specific name of Hooker. In Ledebour's figure, quoted above, the leaves are shorter and rather more obtuse than in our Puget Sound specimens.

9. PENTACÆNA, *Bartl.*1. PENTACÆNA RAMOSISSIMA, *Walp.*

*Pentacæna ramosissima*, Walp. Rep. 1, p. 261.

*P. polynemoides*, Bartl. in Presl. Reliq. Hænk. 2, p. 5, t. 49, fig. 1.

*Paronychia ? ramosissima*, DC. Mém. Paronych. p. 12, t. 4; DC. Prodr. 3, p. 372;  
Torr. & Gray, Fl. 1, p. 171.

HAB. Puget Sound and Gray's Harbor, Washington Territory; also around the Bay of San Francisco, and along the coast of California.—Our plant agrees very well with the figure and description of De Candolle (l. c.), and also with a Chilian specimen of *P. ramosissima*, received from Sir William Hooker, except that the stipules are larger and more silvery in the former. Mr. Nuttall was inclined to regard it as a distinct species. *P. polynemoides*, Walp. (l. c.), is probably not distinct from *P. ramosissima*.

10. SPERGULARIA, *Pers.*1. SPERGULARIA RUBRA, *Pers.*

HAB. Puget Sound, and saline places on the Lower Sacramento, California.—We find both margined and immarginate seeds in the same specimen, as has been noticed before in this variable (and probably composite) species. Some of the Californian specimens seem to be decidedly perennial, with an almost woody base.

11. MOLLUGO, *Linn.*1. MOLLUGO VERTICILLATA, *Linn.*

HAB. Banks of the Columbia and Upper Sacramento Rivers.—This plant, which in the Atlantic States, has every appearance of having immigrated from the south, probably from the Antilles, is rare on the Pacific side, where it may be indigenous. We have received it from thence only in the collections of the Exploring Expedition.



ORD. 14. PORTULACACEÆ.

1. CALANDRINIA, *H. B. K.*

1. CALANDRINIA MENZIESII, *Hook.*

HAB. In various parts of Oregon.—Stamens mostly 8. Petals twisted together after flowering, and afterwards, by the elongation of the capsule, separating at the base like a calyptra, as in *Calyptridium*.

2. PORTULACA, *Tourn.*

1. PORTULACA OLERACEA, *Linn.*

HAB. On the Upper Sacramento, California: apparently indigenous.

3. CLAYTONIA, *Linn.*

1. CLAYTONIA CAROLINIANA, var. SESSILIFOLIA, *Torr.*

HAB. On the Spokane River, Washington Territory.—The specimens resemble in every respect the plant collected by Dr. Bigelow in Whipple's Expedition, in the report of which this plant is described. It is *C. lanceolata* of Hooker's Flora, but not of Pursh.

2. CLAYTONIA PERFOLIATA, *Donn.*

HAB. Puget Sound, and on the Columbia and Kooskooskee Rivers.—A variable species as to height, and in the size and form of the leaves.

3. CLAYTONIA ALSINOIDES, *Sims*.

HAB. Puget Sound, &c.; very common throughout all the region.  
[Now determined to be the original *C. Sibirica*, Linn.]

4. CLAYTONIA LINEARIS, *Dougl. in Hook.*

HAB. Near Nisqually, Puget Sound, and on the Spipen River.—We have little hesitation in referring *C. dichotoma*, Nutt., to *C. linearis*. Some of our specimens are intermediate in characters between the two species. Hooker (in Geyer's Rocky Mount. Pl., Lond. Jour. Bot. 6, p. 230) refers Nuttall's plant to *C. spathulata*, Dougl.; but in our specimens of the former, received from Mr. Nuttall himself, the cauline leaves are all linear and alternate.

5. CLAYTONIA CHAMISSONIS, *Esch. & Ledeb.*

HAB. Near Fort Colville on the Upper Columbia River, and elsewhere.—We have seen no specimens of Bongard's *C. flagellaris*, but it seems to differ from *C. Chamissonis* chiefly in its smaller and proportionally broader leaves, and may be here referred, along with *C. aquatica*, Nutt. in Torr. & Gray.

6. CLAYTONIA PARVIFOLIA, *Mocino*.

HAB. Nisqually, Puget Sound.—The root seems to be perennial in our specimens; and the petals are emarginate, not acutely bifid at the apex, as described by De Candolle, nor entire as in Nuttall's plant.

## 4. TALINUM, ADANS.

## 1. TALINUM SPINESCENS, Sp. Nov.

*T. rhizomate brevi crasso subramoso; foliis brevibus teretibus clavato-linearibus, nervo medio persistente spinulam efficiente; staminibus numerosis; stigmatibus in capitulum arcte conniventibus vel coalitis.*

HAB. Bare rocks between Fort Okanagan and Grand Coulie, on the Upper Columbia River; rare.—Root somewhat fusiform. Rhizoma very thick, rather ligneous than fleshy, divided above into two or three branches, which terminate in slender peduncles 4 to 6 inches long. Leaves nearly half an inch long, thicker towards the extremity, obtuse; the lower portion of the midrib persistent and finally converted into a slender spine. Flowers in a loose compound cyme, 5–6 lines in diameter. Sepals broadly ovate, obtuse, reticulately veined. Petals “beautiful purple,” obovate, entire, three times as long as the sepals. Stamens 22 to 27: filaments shorter than the petals. Style filiform, nearly as long as the petals: stigmas closely combined into a head. This species belongs to the section *Phemeranthus*. It is near *T. teretifolium* and *T. calycinum*, but differs from both in the very thick caudex, crowded and much shorter leaves, the spine-like persistent midribs, and the capitate stigma.

## 5. LEWISIA, Pursh.

## 1. LEWISIA REDIVIVA, Pursh.

HAB. On the Columbia River and its tributaries.—A very remarkable plant, both for its botanical structure, which is anomalous in the order, for the tenacity of life in the root, from which the specific name was derived, and for its large use for food by the aborigines.

## ORD. 15. LINACEÆ.

### 1. LINUM, *Linn.*

#### 1. LINUM PERENNE, *Linn.*

HAB. On the Columbia River and its southern tributaries; the abundant and only flax of that region.

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## ORD. 16. GERANIACEÆ.

### 1. GERANIUM, *Linn.*

#### 1. GERANIUM ERIANTHUM, *DC.*

HAB.—Upper Columbia, Washington Territory; common in moist places.—This is very near *G. maculatum* of the Atlantic States, but the pubescence is more copious and somewhat glandular; also the base of the petals and stamens much more hairy. *G. eriostemon*, Fisch. (of which we have authentic specimens), which Hooker & Arnott (in Bot. Beechey) were inclined to unite with *G. erianthum*, is still nearer *G. maculatum*, the chief difference being the less divided leaves.

2. GERANIUM CAROLINIANUM, *Linn.*

HAB. Interior of Oregon and Washington Territory; not rare.

2. ERODIUM, *L'Her.*1. ERODIUM CICUTARIUM, *L'Her.*

HAB. Interior of Oregon and California; common, and apparently indigenous.

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ORD. 17. OXALIDACEÆ.

1. OXALIS, *Linn.*1. OXALIS OREGANA, *Nutt. in Torr. & Gray.*

HAB. Puget Sound.—There is but a solitary specimen of this plant in the collection, and the flower is unexpanded. It is certainly very like *O. acetosella*, but seems pretty constantly to differ in the characters assigned to it by Mr. Nuttall. The flowers are bright rose-color externally, and paler inside. Bracteoles of the peduncles connate at the base.

2. OXALIS STRICTA, *Linn.*

HAB. Bay of San Francisco and other parts of California.—Diffused under many forms and names over a large part of the world.

## ORD. 18. LIMNANTHACEÆ.

### 1. FLÆRKEA, Willd.

#### 1. FLÆRKEA PROSERPINACOIDES, Willd.

HAB. Near springs, east of the Cascade Mountains, Washington Territory.—The most western station of this plant hitherto recorded, is Franklin, on the Missouri. I can find no characters in which this western plant differs from the ordinary form, except in being considerably smaller. The fruit, however, is very young, so that we cannot compare it with that of the eastern plant.

## ORD. 19. MALVACEÆ.

### 1 SIDA LCEA, Gray.

#### 1. SIDA LCEA MALVÆFLORA, Gray.

*Sidalcea malvæflora*, Gray Pl. Wright, 1, p. 16; Torr. Bot. Whipl. Rep. p. 72.

*S. Neo-Mexicana* & *S. Oregana*, Gray, Pl. Fendl. p. 23.

*Sida malvæflora*, Moq. & Sesse, Fl. Ic. Mex. ined.; DC. Prodr. 1, p. 194; Lindl.

Bot. Reg. t. 1036; Hook. & Arn. Bot. Beechey, p. 326.

*S. Oregana*, Nutt. in Torr. & Gray, Fl. 1, p. 234.

*S. delphinifolia*, Nutt. l. c.

*Nuttallia malvæflora*, Fisch. & Trautv. Ind. Sem. St. Petersburg, 1838.

HAB. Gray's Harbor, and on the Upper Columbia, Washington

Territory. Stem 2 to 4 feet high. Flowers at first in short crowded racemes, which are finally elongated and interrupted, bright purple and rather showy. Petals somewhat emarginate and erosely denticulate at the summit. Calyx nearly smooth without. Capsule nearly glabrous. Carpels slightly mucronate. *S. Oregana* differs only in its smaller flowers, shorter and broader calyx-lobes, and strongly emarginate petals; and there are intermediate forms.

## 2. MALVASTRUM, Gray.

### 1. MALVASTRUM MUNROANUM, Gray.

*Malvastrum Munroanum*, Gray, Pl. Fendl. p. 21.

*Malva Munroana*, Dougl. in Bot. Reg. t. 1306, Hook. Fl. Bor.-Amer. 1, p. 106;

Torr. & Gray, Fl. 1, p. 226.

*M. fasciculata*, Nutt. in Torr. & Gray, Fl. 1. c.

*Nuttallia Munroana*, Nutt. in Jour. Acad. Phil. 7, p. 16.

HAB. Upper Columbia, and valley of the Kooskooskee.—Whole plant pulverulent and grayish pubescent. Stems branching, 1 to 3 feet high. Leaves cordate-orbicular, or sometimes broadly ovate, somewhat 3-lobed, or incised; the lower ones 2 to 3 inches long, the upper scarcely more than an inch. Flowers somewhat fasciculate or paniculate towards the summit of the branches. Calyx densely pubescent, with 2 or 3 slender deciduous bracteoles at the base; the lobes broadly ovate and rather acute. Corolla about three-fourths of an inch in diameter, apparently bright rose-color: petals obovate, slightly emarginate. Styles 8 to 10, smooth: stigmas capitate. Carpels 8 to 10, in a small depressed globose head, densely stellate-pubescent, dehiscent on the back from the summit to near the base. Seed solitary. Radicle inferior.

## 3. SPHÆRALCEA, A. St. Hil.

## 1. SPHÆRALCEA RIVULARIS.

*Malva rivularis*, Dougl. in Hook. Fl. Bor.-Amer. 1, p. 107; Torr. & Gray, Fl. 1, p. 226.

*Sphæralcea acerifolia*, Torr. & Gray, l. c. p. 226.

*Malva* (*Sphæroma*) *acerifolia*, Nutt. in Torr. & Gray, l. c.

HAB. Between Puget Sound and the Cascade Mountains.—Stem apparently tall, robust, flexuous, much branched. Peduncles aggregated two or three together toward the summit of the branches, and forming a somewhat paniculate inflorescence. Bracteoles 3, linear-lanceolate. Corolla about an inch in diameter, apparently deep rose-color: petals obovate, a little oblique. Stamens in many series, the naked portion of the column short. Styles about 14, glabrous: stigmas capitellate. Carpels hispid with stiff hairs, 3-seeded. Seeds rough, with short hairs.

## 2. SPHÆRALCEA LONGISEPALA, Sp. Nov.

*S. caule pilis patentibus hirsuto; foliis 5-7-lobis basi truncatis, lobis acutis serratis; floribus solitariis longe pedicellatis in racemos foliosos dispositis, inferioribus distantibus; laciniis calycis lanceolatis longe acuminatis corollæ subæqualibus.*

HAB. Upper Columbia, Washington Territory.—Plant 4 to 6 feet high, with rather soft spreading hairs. Leaves 3 to 4 inches in length and breadth, thin, sparsely hirsute with simple hairs on both sides, lobed nearly to the middle; the lobes acutely triangular and coarsely serrate: petiole about half the length of the lamina. Flowers nearly two inches in diameter, in long leafy terminal racemes; the lower peduncles 2 or 3 inches long. Calyx deeply 5-lobed, the lobes narrowly lanceolate and tapering to a long point, sparingly hispid-pilose. Bracteoles 3, linear nearly half the length of the calyx. Corolla apparently rose-color; the petals obovate and entire. Sta-



mens in several series; the column one third shorter than the petals. Carpels about 11: styles united below, distinct above, glabrous and capitate. Ovaries with 3 ovules. This species seems to have been entirely overlooked thus far. We have it in no other collections than those of the United States Exploring Expedition.

4. SIDA, Linn.

1. SIDA HEDERACEA, Torr. in Pl. Fendl.

HAB. Plains of the Sacramento River, and around the Bay of San Francisco, California; common.

5. HIBISCUS, Linn.

1. HIBISCUS MOSCHEUTOS, Linn.

Var. OCCIDENTALIS: *foliis cordatis obtuse serratis subtus cano-tomentosis supra pallide viridibus pilis simplicibus pubescentibus; involucello calyce longiore.*

HAB. Marshes on the Lower Sacramento, California; not elsewhere.—The eastern plant differs in the pubescence of under side of the leaves being much whiter, shorter, and more velvety, and that of the upper side only of sparse, extremely minute stellate hairs; the base of the leaves, too, is obtuse, but rarely cordate; and the involucre is no longer than the calyx. It seems to be distinct from both *H. incanus* and *H. grandiflorus*. We believe this species has not been noticed before as occurring west of the Rocky Mountains.

## ORD. 20. ANACARDIACEÆ.

### 1. RHUS, *Linn.*

#### 1. RHUS TOXICODENDRON, *Linn.*

HAB. In the Valley of the Upper Columbia, Washington Territory (the upright variety, with the leaves entire or only slightly toothed): also in California (the climbing form, with toothed leaves).

#### 2. RHUS GLABRA, *Linn.*

Var. OCCIDENTALIS: *foliolis 9-11 lanceolato-oblongis argute serratis; calyce petalis sub-dimidio brevioris; antheris lineari-oblongis.*

HAB. Banks of rivers, near Fort Okanagan and Fort Vancouver; also on the Kooskooskee, Washington Territory.—This plant differs from *R. glabra* of the Atlantic States, in the less numerous and scarcely glaucous leaflets, in the small pedunculate panicle, and in the flower. The calyx in *R. glabra* is nearly as long as the corolla; the anthers are ovate, and not more than half as large as in the Oregon plant. These differences, however, may not be constant, and they can hardly be regarded as specific.—Dr. Gray (Plant. Fendl. p. 28) thinks it probable that, as the species of *Rhus* are all more or less polygamous, the difference between this plant and the ordinary form of *R. glabra* may be owing to sex.

#### 3. RHUS TRILOBATA, *Nutt. in Torr. & Gray.*

HAB. Mountain sides, Northern California.—This species takes the place of the nearly related *R. aromatica* in the Pacific States and

Territories, as well as in New Mexico, Western Texas, and Utah. The leaves and twigs are velvety pubescent, much more commonly than smooth, as the species was described by Nuttall.

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## ORD. 21. SAPINDACEÆ.

### 1. ACER, *Tourn.*

#### 1. ACER MACROPHYLLUM, *Pursh.*

HAB. In forests and on banks of rivers, from Puget Sound southward to San Rafael, California.—It attains its greatest altitude in Washington Territory, where it is sometimes more than 80 feet high, and, in some places, is almost the only deciduous tree. In California it grows only about 30 feet high, with a trunk at most two feet in diameter.

#### 2. ACER CIRCINNATUM, *Pursh.*

HAB. Puget Sound, in wet ground.—Dr. Pickering found it occasionally 30 or 40 feet high, but more commonly it grows in the manner described by Douglas and Nuttall; the low trunk throwing off from the base slender branches, which take root and form dense thickets, and greatly obstruct the traveller. The popular name of this species is *Vine Maple*, from its prostrate habit, and long slender branches. The sepals are hairy externally, and of a dull purple color. Petals orbicular or broadly ovate, half as long as the sepals. Disk 2-lobed. Ovary clothed with long hairs.

## 3. ACER GLABRUM, Torr.

*Acer glabrum*, Torr. in Ann. Lyc. New York, 2, p. 172; Torr. & Gray, Fl. 1, p. 247; Nutt. Sylv. 2, p. 86.

*A. barbatum*, Dougl. in Hook. Fl. Bor.-Amer. 1, p. 113, excl. syn.

*A. Douglasii*, Hook. Lond. Jour. Bot. 6, p. 77, t. 6.

HAB. Between the Upper Columbia and the Cascade Mountains.—A shrub 6 to 12 feet high (10 to 20 feet, according to *Geyer*), forming patches. Leaves 3–5-lobed, pale and glaucous underneath. Flowers not seen. Fruit in a loose, erect, compound umbel. Pedicels elongated. Wings of the samara mostly approximated or even overlapping.

On the sides of the Cascade Mountains, Dr. Pickering found a Maple in fruit, which seems to be almost intermediate between *A. glabrum* and *A. circinnatum*.

## 2. NEGUNDO, Mœench.

## 1. NEGUNDO ACEROIDES, Mœench.

*Negundo aceroides*, Mœench. Method. p. 334; Torr. & Gray, Fl. 1, p. 250.

*N. fraxinifolium*, Nutt. Gen. 1, p. 253; Hook. Fl. Bor.-Amer. 1, p. 114.

*N. Californicum*, Torr. & Gray, l. c. & Suppl. p. 684; Hook. & Arn. Bot. Beech. p. 327, t. 77; Nutt. Sylv. 2, p. 90, t. 72.

HAB. Banks of the Sacramento, and near San Francisco.—A tree 40 feet high, with a trunk two and a half feet in diameter. The leaves are often trifoliolate. The leaflets are usually more pubescent, rather broader, and more incised than in the eastern plant, but in the flowers and fruit there is no difference. *N. Mexicanum*, DC. should also probably be united to this species.

3. *ÆSCULUS*, *Linn.*1. *ÆSCULUS CALIFORNICA*, *Nutt.*

HAB. Fertile places along the Sacramento, and near San Francisco.—Although this is commonly a shrub, only 5 to 10 feet high, Dr. Pickering found individuals of it 25 feet high, with a trunk a foot in diameter. It produces large straggling branches from near the base. On vigorous shoots the leaflets are six to eight inches long and nearly four inches wide.

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## O R D. 22. CELASTRACEÆ.

1. *PACHYSTIMA*, *Raf.* (*OREOPHILA*, *Nutt.*)1. *PACHYSTIMA MYRSINITES*, *Raf.*

HAB. On the Cascade Mountains, and other parts of Washington and Oregon Territories.—Leaves variable in size and form, as well as in the size of the serratures. It is remarkable that all the specimens of this plant that we have received in numerous collections, are in flower only. No botanist except Nuttall appears to have examined the fruit.

## ORD. 23. RHAMNACEÆ.

### 1. FRANGULA, *Tourn., A. Gray.*

#### 1. FRANGULA CALIFORNICA, *Gray.*

*Frangula Californica*, Gray, Gen. Ill. Gen. Am. Bor. 2, p. 178; Torr. Bot. Mex. Bound. Surv. p. 46.

*Rhamnus Californicus*, Eschsch. in Mem. Acad. St. Petersburg. 10, p. 281; Torr. & Gray, Fl. 1, p. 263.

*R. oleæfolius*, Hook. Fl. Bor.-Amer. 1, p. 123, t. 44; Hook. & Arn. Bot. Beechey, p. 136; Torr. & Gray, l. c.

*R. laurifolius*, Nutt. in Torr. & Gray, l. c.

*R. tomentellus*, Benth. Pl. Hartw. p. 303.

HAB. Valley of the Sacramento, and near San Francisco.—A spreading shrub, commonly 3 to 8 feet high, but sometimes attaining the height of 18 feet. The leaves are rather thin when young, but finally they become coriaceous, and commonly about two inches long. They vary from ovate-oblong to elliptical, and are either entire or serrulate. The under surface is more or less distinctly dotted with minute brownish glands or scales, and there are from 12 to 13 pairs of strong veins. In dried specimens the margin is often revolute. The flowers are in small naked or leafy axillary panicles, most of which fail to produce fruit, so that the drupes are either solitary, or two or three together. The limb of the calyx is deciduous, and is usually 5-cleft, but sometimes only 4-cleft; the segments rather acute, and erect. Petals very small, broadly ovate and emarginate, partly embracing the stamens. Style short, 3-cleft. Drupe nearly one-third of an inch in diameter, blackish-purple; the pulp thin: pyrenæ two, plano-convex.

## 2. FRANGULA PURSHIANA.

*Rhamnus Purshianus*, DC. Prodr. 2, p. 25; Hook. Fl. Bor-Amer. 1, p. 123, t. 43;  
 Torr. & Gray, Fl. 1, p. 262; Nutt. Sylv. 2, p. 52.  
*R. alnifolius*, Pursh, Fl. 1, p. 166, non *L'Her.*

HAB. Woods and declivities of mountains, around Puget Sound, and in the interior of Oregon and Washington Territories; also on the upper tributaries of the Sacramento.—This species, in favorable situations, becomes a tree twenty feet high. It is much more nearly related to *F. Caroliniana* than to *F. Californica*, and it is clearly a *Frangula*, although it is not enumerated among the species of that genus by Dr. Gray.

2. RHAMNUS, *Tourn.*1. RHAMNUS CROCEUS, *Nutt. in Torr & Gray.*

HAB. On the Upper Sacramento, California.—A pretty evergreen shrub, about 5 feet high. Leaves half an inch to 2 inches long, often strongly and sharply toothed, usually of a light yellowish-brown underneath, but sometimes (at least in dried specimens) of a copper color. The berries are yellow [or bright red] when ripe. Pyrenæ splitting by the ventral suture. A genuine *Rhamnus*.

3. CEANOTHUS, *Linn.*1. CEANOTHUS PROSTRATUS, *Benth.*

*Ceanothus prostratus*, Benth. Pl. Hartw. p. 302; Torr. Bot. Whipl. p. 75.

HAB. Mountains of the Upper Sacramento, California.—A trailing evergreen shrub. Leaves variable in size, form, and in the number as well as the length of the spiny teeth. The fruit has three erect horn-like processes at the summit.

2. *CEANOTHUS CUNEATUS*, Nutt. in Torr. & Gray.

HAB. Mountains of Northern California; very common.

3. *CEANOTHUS OREGONUS*, Nutt. in Torr. & Gray.

HAB. Puget Sound, and on the Columbia River; also on the Umpqua Mountains in Southern Oregon.—This is an ornamental shrub, sometimes 8 to 10 feet high, with long panicles of white flowers.

4. *CEANOTHUS THYRSIFLORUS*, Esch.

HAB. Hillsides, San Francisco, and other parts of California, commonly not far from the sea. This very handsome species, although usually forming copses, sometimes becomes almost a tree twenty feet or more in height, with a trunk twelve inches in diameter. The branches are reddish-brown, and angular from elevated longitudinal lines or ridges. All the specimens are in fruit, which is the size of a pepper-corn, and without protuberances. This is the *California Lilac*.

Var.? *MACROTHYRSUS*: *foliis ovatis acutis integerrimis supra glabriusculis subtus canescenti-tomentosis; paniculis elongatis interruptis subfoliaceis.*

HAB. Banks of the Umpqua, Oregon.—A shrub, 6 to 8 feet high; the branches terete, often dotted with minute brown resinous papillæ. Leaves 1 to 2½ inches long, moderately acute, grayish-tomentose underneath, the veins prominent and somewhat silky-villous; petioles 3 to 5 lines long. Flowers beautiful blue, in compound umbellate fascicles, which are aggregated in a paniculate manner at the extremity of the branches, the lowest fascicles arising from the axils of the uppermost leaves and somewhat distant from the others. This variety has leaves greatly resembling those of *C. Americanus*, except that they are quite entire, while in the inflorescence it approaches *C. thyrsiflorus*. The specimens were without fruit.



5. *CEANOTHUS VELUTINUS*, Dougl.

*Ceanothus velutinus*, Dougl. in Hook. Fl. Bor.-Amer. 1, p. 125, t. 45; Torr. & Gray, Fl. 1, p. 265.

*C. lævigatus*, Hook. Fl. Bor.-Amer. 1. c.

HAB. Borders of prairies and banks of rivers; Puget Sound, and interior of Washington Territory; also on the Willamette River, Oregon.—Plant 4 to 8 feet high. The leaves are almost sempervirent; when old they nearly lose the copious tomentum of the under surface, so as to be nearly glabrous. Sometimes, indeed, the younger leaves are smooth underneath. The glabrous state of the plant is *C. lævigatus*, Hook., and *C. velutinus* var. *lævigatus*, Torr. & Gray, Fl. 1, p. 686.

6. *CEANOTHUS HIRSUTUS*, Nutt.

*Ceanothus hirsutus*, Nutt. in Torr. & Gray, Fl. 1, p. 266.

*C. oliganthus*, Nutt. 1. c.; Torr. & Gray, 1. c.

*C. sorediatus*, Hook. & Arn. Bot. Beechey, p. 329; Torr. & Gray, 1. c.

*C. Lobbianus*, Hook. Bot. Mag. t. 4811.

*C. diversifolius*, Kellogg in Proceed. Calif. Acad. Nat. Sci. t. 58.

HAB. Upper tributaries of the Sacramento, California.—A shrub with gray, villous, divaricate branches, usually about two feet high. Leaves elliptical, or sometimes obovate, about three-fourths of an inch long, coriaceous, minutely pubescent above, villous and canescent underneath, glandularly denticulate with salient teeth. Panicles terminating small and short leafy branches. Flowers bright blue. Fruit as large as in *C. Americanus*, with a small tubercle at the summit of each angle. We unite the four species enumerated above, as they seem to pass insensibly into each other.

7. *CEANOTHUS INCANUS*, Torr. & Gray.

HAB. Mountains of the Upper Sacramento, California.—In our specimens the branches are more slender and the leaves narrower than in Douglas's plant, as well as more sparingly toothed, but there is no essential difference.

## ORD. 24. VITACEÆ.

### 1. VITIS, *Tourn.*

#### 1. VITIS CALIFORNICA, *Benth.*

*Vitis Californica*, Benth. Bot. Sulph. p. 10, & Pl. Hartw. p. 302.

*V. Caribæa*, Hook. & Arn. Bot. Beech. p. 327; Torr. & Gray, Fl. 1, p. 683.

HAB. Banks of the Sacramento, Northern California.—Plant prostrate, or more commonly climbing trees. Young twigs slightly pubescent. Leaves broadly cordate, somewhat 3-lobed, coarsely toothed, smoothish above when mature, grayish pubescent underneath. Panicle ovate, loosely flowered. Berries about one-third of an inch in diameter (resembling those of *V. cordifolia* or *Chicken Grape*), purple, and covered with a bloom. They are pleasant to the taste, but rather tart, and are sometimes used by the Mexicans for making wine.

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## ORD. 25. POLYGALACEÆ.

### 1. POLYGALA, *Tourn.*

#### 1. POLYGALA NUTKANA, *Moçino & Sessé.*

*Polygala Nutkana*, Moçino & Sessé, ex DC. Prodr. 1, p. 331; Torr. Bot. Mex. Bound. p. 49, t. 12.

*P. Californica*, Nutt. in Torr. & Gray, Fl. 1, p. 671.

*P. cucullata*, Benth. Pl. Hartw. p. 299.

*P. cornuta*, Kellogg, in Proceed. Calif. Acad. Nat. Sc. 1, p. 62.

HAB. Banks of the Sacramento, California.—The prostrate portion of the stem is ligneous, as is also the base of the ascending branches. There are both radical and terminal racemes, as in *P. polygama*; the former partly subterranean, and the flowers apetalous. This is the only known species of *Polygala* in the Pacific States.

## ORD. 26. LEGUMINOSÆ.

### 1. VICIA, *Tourn.*

#### 1. VICIA GIGANTEA, *Hook.*

HAB. Woods, Puget Sound and southward; not found in the interior of the country.

#### 2. VICIA AMERICANA, *Muhl.*

*Vicia Americana*, Muhl. in Willd. Sp. 3, p. 1096; DC. Prodr. 2, p. 355; Hook. Fl. Bor.-Am. 1, p. 157, & Lond. Jour. Bot. 6, p. 206; Torr. & Gray, Fl. 1, p. 269.

*V. Oregona* & *V. truncata*, Nutt. in Torr. & Gray, Fl. 1, p. 270.

HAB. Woods and along rivers; common in Washington Territory and Oregon.—An extremely variable plant, as to the form, texture, and apex of the leaves, as well as in the teeth of the calyx. We find it impossible to define the limits between the species here brought together. We are thus able to confirm the opinion expressed by Sir William Hooker in his account of Geyer's plants.

### 2. LATHYRUS, *Linn.*

#### 1. LATHYRUS MARITIMUS, *Bigel.*

HAB. Sea-coast of Washington Territory and Oregon; common.

2. *LATHYRUS OCHROLEUCUS*, Hook.

HAB. On the Spokane River, Washington Territory.—We are not confident that this is *L. ochroleucus*, but are unable to refer it to any other species. The color of the flowers cannot be determined from the dried specimens. No allusion is made to their being ochroleucous in the notes of Dr. Pickering.

3. *LATHYRUS PALUSTRIS*, Linn.

HAB. Throughout Washington Territory, Oregon, and valley of the Sacramento, California.—Extremely variable in the number and form of the leaflets, shape of the stipules, and relative length of the calyx-segments and tube. We have scarcely a doubt as to *L. myrtifolius* being only an extreme form of this species, to which it has already been referred by Dr. Gray. It was stated long ago, in the Flora of North America, that some of its varieties could not be certainly distinguished from *L. palustris*.

4. *LATHYRUS TORREYI*, Gray.

*Lathyrus Torreyi*, Gray, in Proceed. Amer. Acad. 7, p. 337, 1867.

*L. ? villosus*, Torr. in Suckley's Report, Pacif. R. R. Expl. 12, part 2, p. 54, sine char.

*Orobus villosus*, Torr. in MSS.

HAB. Banks of the Kooskooskee River, Washington Territory.—Villous, erect or assurgent; leaflets 5–7 pairs, and with petiole ending in a short seta or minute leaflet; stipules oblong-lanceolate and semi-sagittate, entire; peduncle axillary, one-flowered, shorter than the leaf. Root perennial. Stem 8–12 inches high, slender, somewhat branching. Leaflets 5–8-lines long, rather acute, membranaceous, the petiole terminating in a short bristle, or in a small leaflet resembling the others in form. Stipules scarcely one-third the size of the leaflets, acute. Peduncles filiform, erect, one-third to one-half the length of the leaves, minutely bracteolate a little below the flower. Flowers

about half as large as in *Lathyrus palustris*. Segments of the calyx linear-lanceolate, acute, the 3 inferior rather longer than the tube, the 2 superior shorter. Corolla purple? This is certainly a congener of *Orobis littoralis*, notwithstanding the one-flowered peduncles, a character which occurs in no other species except *O. saxatilis* and a variety of *O. viciæformis*. [The name under which this plant was first described is substituted, and there is, moreover, a published *L. villosus*. The following species, of very different habit, is left under *Orobis*, although later authorities merge the genus in *Lathyrus*.]

### 3. OROBUS, *Tourn.*

#### 1. OROBUS LITTORALIS, *Gray.*

*Orobis littoralis*, Gray, in Pacif. R. R. Expl. 12, part 2, p. 54, t. 6; Torr. Bot. Mex. Bound. p. 77.

*Astrophia littoralis*, Nutt. in Torr. & Gray, Fl. 1, p. 278.

HAB. On the sea-coast, near Gray's Harbor, Washington Territory.—Plant apparently two feet or more in height, rather stout, much branched. Leaflets, mostly 4, varying from linear-spatulate to obovate-oblong. Stipules ovate, semisagittate. Racemes 5–8-flowered, much longer than the leaves; the flowers about as large as those of *Lathyrus maritimus*. Banner bright purple, obovate-cordate, one-third longer than the paler wings and keel. Stamens diadelphous, 9 and 1: anthers oblong. Style slender, narrowly linear, pubescent and slightly grooved on the inner side. Endlicher places *Astrophia* in *Lathyrus*, but we think it much nearer *Orobis*.

### 4. GLYCYRRHIZA, *Tourn.*

#### 1. GLYCYRRHIZA LEPIDOTA, *Nutt.*

HAB. On the Koo-koo-see and Columbia Rivers; also in fertile places along the Sacramento; sometimes forming large patches.—The stem is 2 to 3 feet high. This species extends eastward to the Mississippi. We find no constant differences between the original *G. lepidota* and the later *G. glutinosa* of Nuttall.

5. PSORALEA, *Linn.*1. PSORALEA LANCEOLATA, *Pursh.*

HAB. On the Upper Columbia and its tributaries.—Stem 12 to 18 inches high, somewhat ligneous toward the base. Leaflets varying from linear-lanceolate and acute to oblong-cuneate and obtuse.

2. PSORALEA PHYSODES, *Dougl.*

HAB. Base of the Cascade Mountains, Washington Territory.—Leaves all trifoliate; the leaflets slightly hairy on both sides. Stipules very small, mostly reflexed.

3. PSORALEA MACROSTACHYA, *DC.*

Var. RHOMBIFOLIA: *minute pubescens; foliis ovato-rhomboides; spicis ovatis vel oblongis.*

HAB. On the Upper Sacramento, California.—Mr. Brackenridge, who collected this plant, found specimens ten feet high; but it is commonly from 3 to 6 feet. It differs from the typical form of the species in the slight pubescence, the want of scabrous dots on the stem and peduncles, and in the short spike.

4. PSORALEA ORBICULARIS, *Lindl.*

*P. caule repente; petiolis pedunculisque longissimis erectis; foliis pinnatim trifoliolatis; foliolis orbiculari-obovatis junioribus pubescentibus demum glabratiss; spicis densis oblongis vel cylindraceis rachide villosissimo; calyce profunde 5-fido, lacinia inferiore lanceolata corollæ subæquilonga, cæteris subulatis.*

*P. orbicularis*, Lindl. Bot. Reg. t. 1971; Torr. & Gray, Fl. 1, p. 304; Hook. & Arn. Bot. Beechey, p. 333.

HAB. Near San Francisco, California; commonly on the borders of marshy places.—Stem minutely pubescent. Petioles 8 to 20 inches

long, more or less pubescent, and slightly sprinkled with little glands. Leaflets  $1\frac{1}{2}$  to  $2\frac{1}{2}$  inches long, and 1 to 2 inches wide, obtuse, pubescent or almost villous when young, but nearly glabrous in the mature plant, thickly dotted with dark-colored glands. Stipules broadly ovate, small. Scapes or peduncles 1 or 2 feet long, naked, terete. Spike 2 to 5 inches long, and an inch or more in diameter, very villous with soft hairs. Calyx villous, sometimes blackish, but more commonly canescent, the hairs mixed with pedicellate glands; the two upper teeth more united than the lateral ones, all of them very acute. Corolla purple, rather longer than the calyx. Vexillum oblong, one-fourth longer than the narrow wings and keel. Stamens diadelphous (9 and 1); the filaments (except the upper one) united nearly to the summit. Ovary villous: style filiform, hairy below, dilated and somewhat clavate upward: stigma capitellate and hairy. Legume ovate, acute, much compressed. Seed oblong, dark-brown. A remarkable species, differing from all others of the genus in its extremely long peduncles and petioles; but a genuine *Psoralea*.

## 6. PETALOSTEMON, Michx.

### 1. PETALOSTEMON MACROSTACHYUM, Torr.

HAB. On the Walla-Walla River, Washington Territory.—In the western plant the leaves do not acquire in drying the bright verdigris green on the upper surface, which is so striking a character in Dr. James's specimens from the Forks of the Platte. The stems are 2 to 3 feet high and somewhat clustered. Petals oblong, unguiculate. Teeth of the calyx as long as the tube. This is the only species of *Petalostemon* found west of the Rocky Mountains.

## 7. TRIFOLIUM, Linn.

### 1. TRIFOLIUM ALTISSIMUM, Dougl. in Hook.

HAB. On the Columbia, Spokane, and Kooskooskee Rivers; abundant in some places: flowering in May.—A tall, showy species, with large oblong heads of purplish-red flowers.

2. TRIFOLIUM PLUMOSUM, *Dougl. in Hook.*

HAB. High plains in the Flat Head country, Rev. Mr. Spalding.—A tall and stout species, with large heads of white flowers. It seems to be confined in its range, having never been received by us in any other collection.

3. TRIFOLIUM LONGIPES, *Nutt. in Torr. & Gray.*

HAB. Prairies in the interior of Oregon and Washington Territory.—Plant 8 to 12 inches high. Leaflets varying from elliptical to linear-lanceolate, an inch or more in length, in the dried specimens strongly veined. Teeth of the calyx filiform-subulate, the three lower twice as long as the tube. Corolla whitish or ochroleucous.

4. TRIFOLIUM MEGACEPHALUM, *Nutt.*

HAB. High and dry prairies of the Upper Columbia.—The specimens differ from the original *Lupinaster megacephalus* of Pursh in the nearly smooth stem and leaves. The legume, moreover, is sessile, and contains only one or two seeds.

5. TRIFOLIUM MICROCEPHALUM, *Pursh.*

HAB. Oregon and Washington Territory: common from the Pacific to the Kooskooskee.—Stems slender, branching, erect or decumbent, from three inches to a foot or more in length.

6. TRIFOLIUM TRIDENTATUM, *Lindl.*

HAB. Puget Sound, and Valley of the Sacramento, California.—This is the *T. involucratum* of Torrey and Gray's Flora, but not of Willdenow, which is a Mexican plant.



7. TRIFOLIUM SPINULOSUM, *Dougl. in Hook.*

HAB. Puget Sound and Gray's Harbor, Washington Territory; also near San Francisco, California.

8. TRIFOLIUM PAUCIFLORUM, *Nutt.*

HAB. Walla-Walla River, Oregon.—A smooth, slender species, which we have seen elsewhere only in the collections of Douglas and Nuttall. The heads are smaller than in *T. microcephalum*. Petals combined with the staminal column.

9. TRIFOLIUM CYATHIFERUM, *Lindl.*

HAB. Damp ground on the Kooskooskee River, Rev. Mr. Spalding.—This rare species, so beautifully illustrated in Hooker's Flora, is seldom met with in collections.

8. MELILOTUS, *Tourn.*1. MELILOTUS PARVIFLORA, *Desf.*

HAB. California, in various parts: Although distinguished by Nuttall, under the name of *M. occidentalis*, this is only the European *M. parviflora* naturalized.

9. HOSACKIA, *Benth.*1. HOSACKIA BICOLOR, *Dougl.*

HAB. Puget Sound, and upper tributaries of the Columbia: abundant in moist grounds.—Stems assurgent. Corolla yellow and white, ornamental wings larger than the somewhat rostrate keel.

2. *HOSACKIA GRACILIS*, *Benth.*

HAB. Umpqua Mountains, in the southern part of Oregon and Northern California.

3. *HOSACKIA SUBPINNATA*, *Torr. & Gray.*

HAB. On the Walla-Walla and Upper Columbia, Washington Territory.—Includes *H. Wrangeliana*, Torr. & Gray, the *Lotus Wrangelianus* of Fischer and Meyer. Plant 8 to 18 inches high, more or less branched, strigosely pubescent. Leaflets mostly 4, 6 to 8 lines long, slightly glaucous, or sometimes canescently hirsute. Flowers solitary, nearly sessile, very small, almost concealed among the leaves, purple and white. Bracts unifoliate or wanting. Lobes of the calyx twice as long as the tube. Legume about half an inch long, nearly obtuse, tipped with the short recurved base of the style; about 3-seeded.

4. *HOSACKIA PARVIFLORA*, *Benth.*

HAB. Prairies near Nisqually, Puget Sound, and interior of Washington Territory.—Plant about a span high. Bracts 1-3-foliate.

5. *HOSACKIA PURSHIANA*, *Benth.*

*Hosackia Purshiana*, Benth. in Bot. Reg. sub t. 1257; Hook. & Arn. Bot. Beechey, p. 137; Torr. & Gray, Fl. 1, p. 327; Torr. Bot. Whipl. Rep. p. 79.

*H. floribunda*, *elata*, *pilosa*, & *mollis*, Nutt. in Torr. & Gray, Fl. l. c.

*Lotus sericeus*, Pursh. Fl. 2, p. 489

*Trigonella Americana*, Nutt. Gen. 2, p. 120.

HAB. Puget Sound, and interior of Washington Territory; also in Oregon and Northern California.—After a comparison of numerous specimens no doubt remains that all the species of *Hosackia* belonging to the section *Psycopsis* must be reduced to one, the various forms

of which cannot be characterized even as varieties. The bracts are sometimes reduced to a single leaflet, or, more rarely, are wanting. In specimens from Walla-Walla the lower leaves are 4-5-foliolate.

6. *HOSACKIA DECUMBENS*, *Benth.*

HAB. Puget Sound and interior of Washington Territory; rather common.

7. *HOSACKIA TOMENTOSA*, *Hook. & Arn.*

HAB. Bay of San Francisco, California.—The specimens are without flowers; but there can be little doubt of the species.

8. *HOSACKIA MICRANTHA*, *Torr. & Gray.*

HAB. Near San Francisco, California.—Leaflets 3 to 5, only 2 to 4 lines long. Umbels all on very short peduncles, 3-7-flowered; the flowers less than one-third of an inch long. Teeth of the calyx subulate, about as long as the tube, and a little shorter than the corolla. Legumes hairy, about 2-seeded. Seeds oblong-cylindrical, nearly black.

9. *HOSACKIA GLABRA.*

*Syrmatium glabrum*, Vogel in Linnæa, 10, p. 591.

*Hosackia scoparia*, Nutt. in Torr. & Gray, Fl. 1, p. 325.

HAB. Near San Francisco, California: common in sandy soils.—This plant has the habit of *Genista*. The stem throws off weak straggling branches, which bear a profusion of yellow flowers. Legumes pubescent with appressed hairs, 2-seeded.

10. *HOSACKIA JUNCEA*, *Benth.*

HAB. Bay of San Francisco, California. This agrees with specimens received from Mr. Nuttall, except in the smaller and somewhat narrower leaves.

10. ASTRAGALUS, *Linn.*1. ASTRAGALUS LENTIGINOSUS, *Dougl. in Hook.*

HAB. Near Fort Okanagan on the Upper Columbia.—Plant diffuse, the branches 8 to 12 inches long. Leaflets 6 to 8 pairs, broadly obovate, one-third of an inch in length. Spike densely capitate, about three-fourths of an inch long and half an inch in diameter. Flowers  $2\frac{1}{2}$  inches long. Calyx villous with grayish hairs; the lanceolate-subulate teeth nearly as long as the subcampanulate tube. Corolla apparently ochroleucous. Vexillum narrowly oblong, somewhat emarginate, a little exceeding the wings. Pods three-fourths of an inch long, coriaceous, globose-ovate, with a strongly incurved acuminate point, strigosely pubescent, completely 2-celled, few-seeded.

2. ASTRAGALUS CHÆTODON, *Sp. Nov.*

*A. procumbens vel assurgens, incano-hirsutus; foliolis 8–17-jugis elliptico-lanceolatis obtusiusculis acutisve; pedunculis folio multo longioribus; spicis oblongis densifloris (fructiferis nunc compactis nunc modice elongandis laxiusculis); calycibus villosissimis, dentibus subulato-setaceis tubo longioribus; legumine calycem vix superante estipitato ovato acuto compresso bilocellato lana decidua vestito, locellis 1–2-spermis.*

HAB. Upper Columbia and its tributaries, especially on the Kooskooskee.—Root thick and woody, perennial. Stems numerous, prostrate or assurgent, somewhat branching, about a foot long, clothed as well as the leaves, with a dense grayish-white pubescence. Leaflets about half an inch long, mostly elliptical-lanceolate and acute, but sometimes broader and rather obtuse. Stipules subulate, distinct, and free from the petiole. Spikes on slender peduncles. Corolla ochroleucous, about one-third of an inch long. Legume scarcely exceeding the calyx-teeth, 3 or 4 lines long, tumid, finely veined transversely; clothed with a white tomentum, which is more or less deciduous. The extreme forms of this species might be taken for distinct species.

but there are specimens in a collection made on the Kooskooskee by Rev. Mr. Spalding, which evidently connect them. [Published in 1863 in Gray's Revision of *Astragalus*, Proceed. Amer. Acad. 6, p. 194.]

3. *ASTRAGALUS ADSURGENS*, *Pall.*

HAB. On the Kooskooskee and Spokane Rivers, Washington Territory.—Plant about two feet high, growing in tufts: considerably taller than Douglasian specimens received from Sir William Hooker.

4. *ASTRAGALUS SUCCUMBENS*, *Dougl. in Hook.*

HAB. On the Walla-Walla River, Oregon.—Whole plant grayish-hirsute. Stem about a foot long, somewhat rigid. Leaflets 5 to 7 pairs, 4 to 6 lines long. Spikes oval, not elongated in fruit, about an inch and a half long. Pods linear-oblong, falcate, smooth and shining, transversely striate, almost completely two-celled by the deep introflexion of the dorsal suture.

5. *ASTRAGALUS GLAREOSUS*, *Dougl. in Hook.*

HAB. Prairies of the Walla-Walla and Kooskooskee Rivers.—Wholly resembles specimens of *A. glareosus* of Douglas received from Sir William Hooker, and certainly the same as *A. argophyllus* of Nuttall.

6. *ASTRAGALUS ALPINUS*, *Linn.*

HAB. On the Spokane and Kooskooskee Rivers, Washington Territory.

7. *ASTRAGALUS SCLEROCARPUS*, *Gray.*

HAB. On the Walla-Walla River, Oregon.—The specimens are in fruit. The leaflets are 4 to 8 lines long, and scarcely more than half

a line wide, deciduous in old plants, leaving the long persistent curved petioles. Pods coriaceous, tumid, tapering at the base into a stipe which is nearly an inch in length. [The above is the name adopted in the Revision of *Astragalus*, above cited, for the *Phaca podocarpa* of Hooker's Flora.]

8. *ASTRAGALUS PURSHII*, Dougl. in Hook.

HAB. Dry prairies on the Upper Columbia, Washington Territory.—Pods about an inch long and half an inch broad, and so thickly covered with yellowish-white hairs as to appear like little balls of wool.

9. *ASTRAGALUS MENZIESII*, Gray, Rev. Astrag.

HAB. Hills near the sea-coast, Bay of San Francisco, California.—Stem about a foot long, Leaflets oblong and linear-oblong, mostly emarginate, half an inch long. Lower stipules partly united. Flowers erect. Calyx-teeth about one-third the length of the tube. Legume nearly an inch and a half long and three-fourths of an inch wide, slightly reticulated. [The above is the name adopted in the Revision of *Astragalus*, above cited, 1863, for the *Phaca densifolia* of Smith, and *P. Nuttallii*, Torr. & Gray, Fl.]

10. *ASTRAGALUS LEUCOPHYLLUS*, Torr. & Gray.

HAB. Bay of San Francisco, and lower part of the Sacramento, California.—Stipules triangular-subulate from a broad base. Legumes ovate, inflated, membranaceous, nearly two inches long, abrupt at the base and supported on a slender stipe of nearly its own length. The pubescence almost disappears from the leaves in the old plant.

11. *ASTRAGALUS COLLINUS*, Dougl. in Hook.

HAB. On the Kooskooskee River; in fruit.—A rare species; for the characters of which Gray's revision of the genus may be referred to.

## 12. ASTRAGALUS FILIPES, Sp. Nov.

A. HOMALOBUS, *appresse puberulus; caule gracili paniculato-ramoso; foliis subremotis angustissime linearibus parvis (lin. 3-4 longis); pedunculis gracillimis folio multo longioribus; racemoso sparsifloro; floribus in pedicello erectiusculo vel patente nutantibus; calyce campanulato haud gibboso albido-puberulo, dentibus subulatis; corollæ albæ vexillo carinam paullo superante; legumine fere glabro lineari-oblongo complanato basi in stipitem calyce ter longiorem angustato.*

HAB. Interior of Washington Territory, near Fort Okanagan.—[This has also been collected by Burke, near Fort Hall, as appears from specimens in the Hookerian herbarium, and recently by S. Watson in Clarence King's Exploration. The above-cited character, which was founded on the specimens of the present Expedition, is taken from Gray's revision, above cited.]

13. ASTRAGALUS MULTIFLORUS, Gray, *Rev. Astrag.*

HAB. Upper Columbia and its tributaries.—The length of the stipe is variable, and there are no stable characters to distinguish Nuttall's *Homalobus dispar* from his *H. multiflorus*.

## 14. ASTRAGALUS SEROTINUS, Gray.

*Astragalus (Homalobus) serotinus*, Gray, in *Pacif. R. R. Expl.*, p. 47, t. 5, & *Rev. Astrag.* l. c. p. 229.

HAB. Between the mouth of the Spokane River and Fort Colville, on the Upper Columbia, Washington Territory.

## 11. OXYTROPIS, DC.

## 1. OXYTROPIS LAMBERTI, Pursh.

HAB. Interior of Washington Territory and Oregon.—Our specimens are in fruit; but they doubtless belong to the variable *O. Lambertii*, including *O. sericea* and *Plattensis* of Nuttall. The pods are ovate-oblong, acuminate, somewhat turgid, compressed vertically, half-2-celled from the introflexion of the ventral suture, and more or less pubescent.

## 12. LUPINUS, Tourn.

## 1. LUPINUS MICRANTHUS, Dougl.

HAB. Prairies near Nisqually, Puget Sound, and California.

## 2. LUPINUS MICROCARPUS, Sims.

HAB. Walla-Walla River, Northern Oregon, and in California.

## 3. LUPINUS PUSILLUS, Pursh.

HAB. Walla-Walla River, Northern Oregon.

## 4. LUPINUS MINIMUS, Dougl. in Hook.

HAB. Willamette Valley, Oregon, to the northern border of California.—Stems 6–10 inches high, assurgent, almost naked, the leaves being mostly radical and on very long petioles. Spikes densely flowered; the flowers as large as in *L. perennis*. Bracts persistent, a little longer than the calyx. Very near *L. lepidus*.



5. LUPINUS LEPIDUS, *Dougl.*

HAB. Washington Territory and Oregon, from the Pacific eastward to the Upper Columbia.

6. LUPINUS POLYPHYLLUS, *Lindl.*

HAB. Washington Territory; on the Upper Columbia.—Differs from our typical specimens in the spikes being much shorter and the leaves more hairy.

7. LUPINUS RIVULARIS, *Dougl.*

HAB. From Nisqually to the Cascade Mountains; also, a form of it on the Upper Columbia and its tributaries. [The latter is described as having long dense spikes of shortly pedicelled flowers, and was referred here with some doubt by Dr. Torrey. The specimens are not found in his herbarium.]

8. LUPINUS ALBICAULIS, *Dougl. in Hook.*

HAB. On Rogue River, Southern Oregon.

9. LUPINUS LEUCOPHYLLUS, *Lindl.*

HAB. Oregon and Washington Territory; common.

10. LUPINUS ORNATUS, *Dougl.*

HAB. Washington Territory, east of the Cascade Mountains.—Differs from *L. leucophyllus* chiefly in the more branching habit, usually looser spikes, and distinctly pedicellate flowers. It may not be specifically distinct.

11. LUPINUS SERICEUS, *Pursh.*

HAB. Eastern slope of the Cascade Mountains.—Our specimens belong to a low subalpine form, and wholly resemble a *Lupinus* collected in Western Utah, in Beckwith's Expedition.

12. LUPINUS LITTORALIS, *Dougl.*

HAB. Near Gray's Harbor, Washington Territory.—The solitary specimen is in fruit. The pods are 10–13-seeded.

13. LUPINUS ARBOREUS, *Sims.*

*L. macrocarpus*, Hook. & Arn. Bot. Beech. p. 329.

HAB. Around the Bay of San Francisco; common in sandy soils.—We have united the two shrubby yellow-flowered species of California, as there is little to distinguish them except the degree of the pubescence. Dr. Pickering, in his notes, states that the plant has a spreading top, and often branches from the base. The stems are 3–6 feet long, and the woody trunk is sometimes 6 inches in diameter.

14. LUPINUS ALBIFRONS, *Benth.*

HAB. Klamath River, Northern California, and southward to San Francisco.

13. THERMOPSIS, *R. Br.*1. THERMOPSIS FABACEA, *DC.*

*Thermopsis fabacea*, DC. Prodr. 2, p. 99; Hook. Fl. Bor.-Amer. 1, p. 128; Torr. & Gray, Fl. 1, p. 388; Bot. Mag. t. 1272; Gray, in Mem. Amer. Acad. 6, p. 385. *T. montana*, Nutt. in Torr. & Gray, Fl. 1. c.; Gray, Pl. Fendl. p. 38.

HAB. Hillsides, valley of the Kooskooskee, Washington Territory.—Plant 2 to 3 feet high, erect, moderately branching above. Stipules ovate, an inch long. Leaflets 2 to 3 inches long, varying from elliptical-oval to obovate, somewhat silky, pubescent when young, smooth when in fruit. Flowers alternate and in pairs, bright yellow. Calyx campanulate; the three upper teeth acute, half as long as the tube, the two upper shorter and united more than half their length. Legumes 2 to 3 inches long, and  $2\frac{1}{2}$  lines wide, erect, 12–14-seeded.

2. THERMOPSIS MACYOPHYLLA, *Hook. & Arn.*

HAB. Near San Francisco, California.—The specimens are without flowers, and the leaves scarcely more than an inch long.

14. PICKERINGIA, *Nutt.*1. PICKERINGIA MONTANA, *Nutt. in Torr. & Gray.*

HAB. Sides of Mount Palmas, near San Francisco; abundant.—A rigid and much-branched evergreen spinescent shrub. The leaves are sessile, and the leaflets vary from one-third to three-fourths of an inch long. Flowers nearly sessile in the axils of the uppermost leaves, and in short terminal racemes, about 8 lines long. Calyx slightly 5-toothed. Carolla bright purple; the petals of nearly equal length. Vexillum suborbicular, nearly surrounding and inclosing the

other petals. Stamens distinct to the base: filaments alternately longer: anthers oblong. Ovary 8-10-ovuled, hairy; the style short and incurved: stigma very minute, naked. Although we have received this plant in a number of Californian collections, and it is not uncommon in that State, the fruit remains a desideratum. From the character of the ovary the legume is probably linear and several seeded.

Bentham is inclined to refer *Pickeringia* to *Anagyris*, and it is certainly nearly allied to that genus; but until the fruit of the former is known, the two genera cannot be satisfactorily compared. *Anagyris* differs in having a short vexillum, and in the presence of stipules. No traces of stipules have been found in *Pickeringia*.

## 15. CERCIS, *Linn.*

### 1. CERCIS OCCIDENTALIS, *Torr.* (Tab. 3.)

*Cercis occidentalis*, Torr. in Gray, Pl. Lindh. 2, p. 177; & Bot. Whipl. Rep. p. 82.  
*C. siliquastrum*, var. *floribus paullo minoribus*, Benth. Pl. Hartw. p. 307.

HAB. Mountains of Northern California.—This extends southward, along the foot hills of the Sierra Nevada. It also occurs in Western Texas, and in the high lands near Saltillo, Mexico. It retains its distinctive character of the broad short pods in all this wide range; so that we are satisfied it cannot be a variety of *C. siliquastrum*. With *C. Canadensis* it need never be confounded. Mr. Brackenridge saw no specimens of it more than twelve feet high; but Col. Fremont, in one instance, found it a good-sized tree.

PLATE 3. CERCIS OCCIDENTALIS: Branches showing the inflorescence and foliage. Fig. 1. A flower. 2. The separated petals. 3. A flower with the corolla removed. 4. The pistil. 5. Pods, of natural size. 6. A seed. 7. Transverse section of the same. 8. Longitudinal section. All the details more or less magnified.

## ORD. 27. ROSACEÆ.

### 1. PRUNUS, *Linn.*

#### 1. PRUNUS (CERASUS) MOLLIS, *Dougl.*

HAB. Borders of Puget Sound; common in woods.—A small tree; usually from 10 to 20 feet high; the fruit small, oval, and unpalatable.

#### 2. PRUNUS (CERASUS) EMARGINATA, *Dougl. in Hook.*

HAB. Sides of the Cascade Mountains, Washington Territory.—A shrub, 6 to 7 feet high, with slender branches, and leaves scarcely an inch long. It is closely related to *P. mollis*.

#### 3. PRUNUS (PADUS) VIRGINIANA, *Linn.*, var. DEMISSA.

HAB. Puget Sound, and mountains in the interior of Washington Territory.—This is the *Cerasus demissa* of Nuttall; but on comparing numerous specimens of the western plant with *P. Virginiana* of the Atlantic States, I am unable to find reliable characters for distinguishing them.

#### 4. PRUNUS (PADUS) SEROTINA, *Ehrh.*

HAB. Eastern slope of the Cascade Mountains, and on the Upper Columbia River.

## 5. PRUNUS (LAUROCERASUS) ILICIFOLIA.

*Cerasus ilicifolia*, Nutt. in Torr. & Gray, Fl. 1, p. 411, & Sylv. 2, p. 16, t. 17;  
Hook. & Arn. Bot. Beechey, p. 340, t. 83.

HAB. Near San Francisco, and in other parts of Upper California.—The mature fruit of this cherry is purple when ripe, orbicular, compressed, and more than three-fourths of an inch in diameter, with a thin, rather acid pulp, and a fragile shell.—*Holly-leaved Cherry*.

## 2. NUTTALLIA, Torr. &amp; Gray.

## 1. NUTTALLIA CERASIFORMIS, Torr &amp; Gray.

*Nuttallia cerasiformis*, Torr. & Gray, in Hook. & Arn. Bot. Beechey, p. 336, t. 82;  
& Fl. 1, p. 413.

HAB. Forests of Oregon, and in California as far south as Santa Barbara.—A shrub, or small tree, seldom more than 15 feet high, with few, slender, mostly upright branches. A remarkable character in the seeds of this plant is that the cotyledons are convolute, not so strongly as in *Calycanthus*, but very distinctly so; a character which has been detected in no other Rosacea except *Chamæmeles*.

## 3. SPIRÆA, Linn.

## 1. SPIRÆA OPULIFOLIA, Linn.

HAB. Banks of rivers, from Washington Territory to California; chiefly the varieties *mollis* and *capitata*.—The Pacific forms generally differ from the eastern in having more acute and incised leaves, with lower surface, pedicels, and calyx more or less pubescent. In the seeds of this species there is a thin but evident albumen. [Upon this

account it is referred to the Himalayan genus *Neillia* by Bentham and Hooker, Gen. Pl.] The same occurs in *Gillenia*, and still more manifestly in Dr. Gray's recently published genus *Neviusa*.

2. SPIRÆA BETULÆFOLIA, *Pall.*

HAB. Interior of Oregon and Washington Territory; frequent in stony lands.—A shrub, usually 2 to 4 feet high, with pale purple flowers. Ovaries glabrous.

3. SPIRÆA DOUGLASII, *Hook.*

HAB. Fraser River, and south to California.—The tomentum of the lower surface of the leaves often rusty-colored, at least in dried specimens.

4. SPIRÆA MENZIESII, *Hook.*

HAB. Interior of Oregon and Washington Territory; common near streams.—This species is intermediate between *S. tomentosa* and *S. salicifolia*; resembling the former in its inflorescence, and the latter in its foliage.

5. SPIRÆA ARLÆFOLIA, *Smith.*

HAB. British Columbia and Washington Territory, also in California; common in most shady woods; and often 8 to 15 feet high.

6. SPIRÆA ARUNCUS, *Linn.*

HAB. Puget Sound and Upper Columbia River, in shady places.

4. C E R C O C A R P U S, *H. B. K.*1. CERCOCARPUS PARVIFOLIUS, *Nutt.*

HAB. Umpqua River, Southern Oregon, and Valley of the Sacramento, California.—A shrub, sometimes attaining the height of 12 to 14 feet, with a stem six inches in diameter. The leaves vary from narrowly cuneate-oblong to broadly obovate, and from less than an inch to two and a half inches long. It includes *C. betulifolius* of Nuttall.

5. P U R S H I A, *DC.*1. PURSHIA TRIDENTATA, *DC.*

HAB. Interior of Washington Territory, and Oregon to the borders of California; eastward to the Rocky Mountains, but rare beyond long. 108°. The most southern station known to us is derived from the collections and notes of Col. Fremont. He found the plant on the eastern side of the Sierra Nevada, in latitude 34° 27' and longitude 117° 13'.

6. G E U M, *Linn.*1. GEUM MACROPHYLLUM, *Willd.*

HAB. Borders of Puget Sound and eastward to Canada and high mountains of New England; common in woods.

2. GEUM (SIEVERSIA) TRIFLORUM, *Pursh.*

HAB. Prairies near Gray's Harbor. Ravines and plains of the Nez Percés country, extending eastward to Northern New York, New Hampshire, &c.—A low and less villous form, with the stems scape-like and only one-flowered, was found on the Upper Columbia.



7. HORKELIA, *Cham. & Schlecht.*1. HORKELIA CALIFORNICA, *Cham. & Schlecht.*

HAB. Ravines near San Francisco, California.—Calycine appendages variable, sometimes shorter, but often longer than the segments; often trifid. Petals nearly as long as the calyx, white, obtuse, with scarcely any claw. Disk smooth. Filaments less dilated than in the other species, with a grooved ridge on the face: anthers linear-oblong. Styles slightly curved at the summit. Chamisso and Schlechtendal state that the filaments which are opposite the petals fall away with those organs, but we have not observed this to be the case in any of the species which we have examined.

2. HORKELIA CONGESTA, *Hook.*

HAB. Southern Oregon and Northern California.—The species includes *H. hirsuta* of Lindley. The petals vary in size and form.

8. IVESIA, *Torr. & Gray.*1. IVESIA PICKERINGII, *Torr. & Gray.* (Tab. 4.)

*I. (Albifloræ 15–20-andræ; caulibus gracilibus magis foliatis; cyma paniculata; foliis albido-lanatis primum saltem myosuroideis; filamentis gracillimis): pedalis; foliolis demum patentiusculis 3–5-partitis sectisve, segmentis oblongis; pedicellis calyce (fructifero oblongo-campanulato) brevioribus; lobis accessoriis calycis ovato-lanceolatis; staminibus 20 manifeste tri-seriatis; antheris mucronulatis; carpellis 4–6.*

*Ivesia Pickeringii*, Torr. & Gray in Newberry, Rep. Pacif. R. R. Expl. 4, p. 72; Gray in Proceed. Amer. Acad. 6, p. 531.

HAB. Northern California, on the Klamath River.—An interest-

ing species most resembling *Ivesia Gordonii*, Torr. & Gray, l. c., on the one hand, and *I. santolinoides*, Gray, on the other. Characters of all three are given in the memoir above cited.

PLATE 4. *Ivesia Pickeringii*: of the natural size. Fig. 1. Portion of a leaf. 2. A flower. 3. Portion of the calyx, with a petal and two stamens. 4. The entire calyx laid open, showing the insertion of the stamens. 5. Pistils. 6. A separate pistil. 7. Ovary laid open longitudinally, showing 9. An achenium. 8. Transverse section of the same. 10. A seed. 11. The embryo.

## 9. P O T E N T I L L A, *Linn.*

### 1. POTENTILLA RIVALIS, *Nutt.*

HAB. Low grounds, California, Oregon, and Washington Territory.—The var. *millegrana*, *P. millegrana*, Dougl. [Confounded with *P. Norvegica*.]

### 2. POTENTILLA GRACILIS, *Dougl.*

HAB. Nisqually, Puget Sound; the typical plant. Washington Territory and Oregon, in rich soils; the var. *flabelliformis* (*P. flabelliformis*, Lehm.); evidently not specifically distinct.

### 3. POTENTILLA FRUTICOSA, *Linn.*

HAB. Near Fort Colville on the Columbia; seen nowhere else in Washington Territory or Oregon.

### 4. POTENTILLA ANSERINA, *Linn.*

HAB. San Francisco, California (var. *communis*). Puget Sound, in woods (var. *grandis*). Saline soils between Fort Okanagan and Grand Coule (var. *concolor*).

5. *POTENTILLA PALUSTRIS*, Scop.

HAB. Puget Sound; the most southern station of this plant on the west coast of North America, hitherto noticed.

10. *FRAGARIA*, Tourn.1. *FRAGARIA CHILENSIS*, Ehrh.

HAB. Hillsides near San Francisco, California.

2. *FRAGARIA VESCA*, Linn.

HAB. Oregon and Washington Territory; common.—It is possible that some of the specimens referred to this species may belong to *F. Virginiana*, it being very difficult to distinguish the Pacific forms of the two.

11. *RUBUS*, Tourn.1. *RUBUS NUTKANUS*, Mocino.

HAB. Woods and banks of rivers; common around Puget Sound, and in the interior of Oregon and Washington Territory.—We have no hesitation in referring *R. relutinus*, Hook. & Arn. to this species. It differs in scarcely any respect except in the leaves and branchlets being more pubescent; and specimens are not unusual that connect the two forms.

2. *RUBUS STRIGOSUS*, Michx.

HAB. Interior of Washington Territory; rather common; but not found near the coast.—The plant is more hispid, and the leaves are

smaller than in the *R. strigosus* of the Atlantic States. The white pubescence of the under surface of the leaves mostly disappears with age.

3. RUBUS SPECTABILIS, *Pursh.*

HAB. Banks of rivers, from Puget Sound, eastward to the Cascade Mountains.—An upright ornamental shrub, 8 to 10 feet high, with few branches, and large deep purple flowers. The fruit, which is called *Salmon-berry* by the white inhabitants, is of a red or orange color, large, and finely flavored. It is much prized as an article of food by the Indians throughout the territory.

4. RUBUS MACROPETALUS, *Dougl. in Hook.*

HAB. Along ravines and rivers of the coast, near San Francisco, California.

12. P H O T I N I A, *Lindl.*

1. PHOTINIA ARBUTIFOLIA, *Lindl.*

HAB. Near San Francisco, California.—This beautiful evergreen shrub is abundant among the *scrubby* growth of the coast. It sometimes attains the height of 20 feet, with a trunk 12 inches in diameter, which divides into spreading branches. The fruit is about the size of a small pea, red, and usually ripens but a single seed in each of its cells. The kernel exhales a strong odor of bitter almonds when bruised.

13. A M E L A N C H I E R, *Medic.*

1. AMELANCHIER CANADENSIS, var. ALNIFOLIA, *Torr. & Gray.*

HAB. Puget Sound, and eastward; common in the interior of Washington Territory.—The fruit of this small tree is called *Kithkaya* by

the Indians, and *Little Service-berry* by the settlers. It is palatable, and hundreds of bushels of it are dried for winter use. Among the specimens of this plant in the collection is one from Nisqually, in which many of the leaves are quite entire, and the rest only sparingly serrate towards the summit.

14. CRATÆGUS, *Linn.*

1. CRATÆGUS SANGUINEA, *Pallas.*

HAB. Puget Sound, and eastward to the Columbia, also in the Nez Perces country; common along rivers: the var. *Douglasii*, Torr. & Gray. This grows from ten to twelve feet high. All the specimens in the collection have narrower leaves, with the base more cuneiform than in the Siberian *C. sanguinea*. The spines are short and stout.

15. PYRUS, *Linn.*

1. PYRUS RIVULARIS, *Dougl. in Hook.*

HAB. Shores of Puget Sound: common. Gulf of Georgia, Dr. Holmes; not seen in the interior of the country.—This is a tree, 30 feet high, with a trunk nine inches in diameter; very variable in the foliage. On the same individual some of the leaves are undivided, and others are 3-lobed. Usually they are obovate, but sometimes oblong and even almost lanceolate. When young, the under surface is covered with a white tomentum. The calyx segments fall off as the fruit ripens.

2. PYRUS (SORBUS) AMERICANA, *DC.*

HAB. Cascade Mountains of Oregon.—In all our Oregon specimens there are only eleven leaflets; but otherwise they do not appear to differ from the eastern plant. [It is doubtless *P. sambucifolia*, Cham. & Schlecht., which extends eastward to Lower Canada.]

16. R O S A, *Tourn.*1. ROSA BLANDA, *Ait.*

HAB. California, Oregon, and Washington Territory; from the sea-coast part to the Rocky Mountains.—A variable species, including, if we mistake not, the *R. fraxinifolia*, *R. Woodsii*, and also Chamisso and Schlechtendal's *R. Californica*.

2. ROSA GYMNOCARPA, *Nutt.*

HAB. Fertile places near the Cascade Mountains, Oregon; and at Nisqually, Puget Sound.—A low bush, with neat foliage. It is remarkable for its small, ovate, naked fruit, the calycine segments being deciduous.

17. A D E N O S T O M A, *Hook. & Arn.*1. ADENOSTOMA FASCICULATA, *Hook. & Arn.*

HAB. California, near San Francisco; on hillsides; very abundant on Mount Palmas.—A shrub from 3 to 5 feet high, with a perfectly upright stem and horizontal branches. Leaves in young plants 3-cleft, or sometimes pinnatifidly cut into 5 or 7 linear segments.

18. A L C H E M I L L A, *Tourn.*1. ALCHEMILLA ARVENSIS, *Scop.*

*A. occidentalis* & *A. cuneifolia*, Nutt. in Torr. & Gray, Fl. 1, p. 432.

HAB. Sterile soils, in prairies near Nisqually, Puget Sound.—Perhaps introduced from Europe. It is, however, not uncommon in various parts of California.

19. SANGUISORBA, *Linn.*1. SANGUISORBA ANNUA, *Nutt.*

HAB. Fort Colville, on the Upper Columbia, and on the Spokane River, Washington Territory.—The specimens are much more robust than any that we have from eastern stations. *S. microcephala*, Presl, *Epimelia*, is a synonym.

20. ACÆNA, *Linn.*1. ACÆNA TRIFIDA, *Ruiz & Pavon.*

HAB. Near San Francisco, California. Dr. Parry found it at Monterey, in the same State.

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## ORD. 28. CALYCANTHACEÆ.

1. CALYCANTHUS, *Linn.*1. CALYCANTHUS OCCIDENTALIS, *Hook. & Arn.*

HAB. Mountain sides of the Upper Sacramento, California.—The flowers are mostly terminal and three together; the peduncle of the middle one much longer than the others. Fruit not half as large as in *C. floridus*, truncate; the orifice scarcely contracted, and the short hairy styles somewhat exserted. Achenia very numerous, ovate, hairy.

## ORD. 29. LYTHRACEÆ.

### 1. AMMANNIA, *Houston.*

#### 1. AMMANNIA LATIFOLIA, *Linn.*

HAB. Along the Sacramento River, California; in wet places.—Differs from the ordinary form of the plant in its broader and shorter leaves, which are subcordate, but neither dilated nor auriculate at the base, and in the shorter but still very distinct style.

### 2. LYTHRUM, *Linn.*

#### 1. LYTHRUM ALATUM, *Pursh.*

HAB. Marshes along the Sacramento River, California.—We find the length of the pedicles, as well as that of the accessory teeth of the calyx, to be variable in this species. Our specimens show a transition from *L. alatum* to *L. Californicum*, Torr. & Gray; the *L. lineare* of Hooker and Arnott, not of Linn.



## ORD. 30. ONAGRACEÆ.

### 1. ZAUSCHNERIA, *Presl.*

#### 1. ZAUSCHNERIA CALIFORNICA, *Presl.*

HAB. Borders of the Sacramento, and near San Francisco, California.—Leaves variable in breadth and pubescence; a polymorphous species.

### 2. EPILOBIUM, *Linn.*

#### 1. EPILOBIUM ANGUSTIFOLIUM, *Linn.*

HAB. California, Oregon, and Washington Territory; in moist and fertile soils.

#### 2. EPILOBIUM TETRAGONUM, *Linn.*

HAB. Interior of Oregon; in marshy places; the var. *glandulosum*, Torr. & Gray, l. c.

#### 3. EPILOBIUM COLORATUM, *Muhl.*

HAB. On the Sacramento, California, and northward to Washington Territory, in rich wet soils.

#### 4. EPILOBIUM MINUTUM, *Lindl.*

HAB. Around Puget Sound, and eastward to the Columbia River.

5. *EPILOBIUM PANICULATUM*, *Nutt.*

HAB. On the Lower Sacramento, on dry ground (with the flowers smaller than in *E. palustre*); and in prairies between the Willamette River and Northern California (with the flowers three times larger, and the plant 2 or 3 feet high).

3. *ŒNOTHERA*, *Linn.*1. *ŒNOTHERA BIENNIS*, *Linn.*

HAB. Interior of Oregon and Washington Territory, and west to the Pacific; also on Fraser's River, British Columbia.—This species is as variable west of the Rocky Mountains as in the Atlantic States.

2. *ŒNOTHERA ALBICAULIS*, *Nutt.*

HAB. Interior of Oregon, on banks of rivers; frequent; in forms similar to those east of the Rocky Mountains.

3. *ŒNOTHERA (GODETIA) LINDLEYI*, *Dougl.*

HAB. Valley of the Columbia, and at Nisqually, Puget Sound.—A very showy plant, with large lilac-purple flowers.

4. *ŒNOTHERA (GODETIA) QUADRIVULNERA*, *Dougl.*

HAB. Interior of Oregon and Washington Territory; common.

5. *ŒNOTHERA (BOISDUVALIA) DENSIFLORA*, *Lindl.*

HAB. On the Spokane River, Washington Territory, in elevated forests; Rev. Mr. Spalding.

6. *ÆNOTHERA* (SPHÆROSTIGMA) *HETERANTHA*, *Nutt.*

HAB. On the Spokane River, Washington Territory.—Leaves all radical, 4 to 6 inches long, and an inch or more broad; nearly entire. Flowers an inch in diameter; the tube of the calyx very long and slender. Capsules sessile and partly concealed in the bases of the leaves, oblong, acute, angular. Seeds in a single series, oblong and somewhat cylindrical, ascending.

7. *ÆNOTHERA* (SPHÆROSTIGMA) *CHEIRANTHIFOLIA*, *Hornem.*

HAB. Near San Francisco, California.—All the specimens have the pods much contorted.

8. *ÆNOTHERA* (SPHÆROSTIGMA) *ANDINA*, *Nutt.*

HAB. On the Cascade Mountains of Oregon.—Of this singular little plant there are two forms in the collections; one of them with very minute flowers, agreeing exactly with Nuttall's original specimens, except that the plant is only 2 or 3 inches high, and branches from near the summit; the other is of the same size and habit, but the leaves are broader, and the flowers are four or five times larger.

9. *ÆNOTHERA* (SPHÆROSTIGMA) *CONTORTA*, *Dougl.*

HAB. Prairies of the Kooskooskee, Washington Territory.—There can be no doubt, now that we have a fuller set of specimens, that *R. parvula*, Nutt. (as was suspected in the Flora of North America), is the same as *R. contorta*. The capsules become contorted when old. According to Dr. Pickering, the flowers are yellow or reddish.

10. *ÆNOTHERA* (SPHÆROSTIGMA) *STRIGULOSA*, *Torr. & Gray.*

HAB. Port Discovery, Washington Territory.

4. GAYOPHYTUM, *Adr. Juss.*1. GAYOPHYTUM RAMOSISSIMUM, *Torr. & Gray.*

HAB. Prairies of the Upper Columbia, Washington Territory.

5. CLARKIA, *Pursh.*1. CLARKIA PULCHELLA, *Pursh.*

HAB. On the Upper Columbia and Kooskooskee Rivers; in plains and stony places; probably the very district in which this plant was discovered by Lewis and Clarke.

2. CLARKIA RHOMBOIDEA, *Dougl. in Hook.*

HAB. Plains near the Cascade Mountains, Oregon.—This species makes a near approach to *Ænothera*, section *Godetia*, and particularly the second division of that section. The flowers are scarcely one-third as large as those of *C. pulchella*.

6. GAURA, *Linn.*1. GAURA PARVIFLORA, *Dougl. in Hook.*

HAB. On the Walla-Walla River, Oregon; a common and widespread species; the only one west of the Rocky Mountains.

7. JUSSIÆA, *Linn.*1. JUSSLÆA REPENS, *Linn.*

HAB. California, in rivulets near San Francisco, and southward.

8. CIRCÆA, *Tourn.*1. CIRCÆA LUTETIANA, *Linn.*

HAB. Woods, Puget Sound, and interior of Washington Territory.—Flowers much smaller than in the plant of the Eastern States; in which respect, and in its included disk, it resembles *C. alpina*. The bracts are not unfrequently present in the ordinary form of *C. Lutetiana*, as it occurs near New York. [This is the newly published *C. Californica* of Ascherson and Magnus, in the Botanische Zeitung for 1871, p. 392.]

9. MYRIOPHYLLUM, *Vaill.*1. MYRIOPHYLLUM VERTICILLATUM, *Linn.*

HAB. Puget Sound; and near San Rafael, California.—Without flowers; the species therefore uncertain.

## ORD. 31. LOASACEÆ.

### 1. MENTZELIA, *Linn.*

#### 1. MENTZELIA ALBICAULIS, *Dougl.*

HAB. Interior of Washington Territory; in prairies; extending southward to San Diego in California, and eastward to Texas.—Stem more or less smooth, the lower part usually (but not always) whitish and shining. Leaves varying from deeply sinuate-pinnatifid to remotely toothed. Lobes of the calyx lanceolate. Petals obovate; very obtuse. Filaments about 15, very slender. Capsule about an inch long, and a line and a half in diameter. Seeds rhombic-cuboid; minutely scabrous.

#### 2. MENTZELIA LÆVICAULIS, *Dougl.*

HAB. On the Klamath River, Northern California; and Walla-Walla, Oregon.—According to Mr. Brackenridge, who collected the specimens, the flowers are of a "pale-yellow color." Sir William Hooker unites this species with *M. ornata*; but it differs, according to Dr. Gray, in its yellow flowers, which open in the afternoon in bright sunshine, while those of *M. ornata* open near sunset, and remain expanded through the evening. Vid. Gray, Pl. Fendl. p. 47, and Pl. Wright, Part 1, p. 73.

## ORD. 32. MESEMBRYANTHEMACEÆ.

### 1. MESEMBRYANTHEMUM, *Linn.*

#### 1. MESEMBRYANTHEMUM MUTABILE, *Haw.?*

HAB. Abundant on rocks near salt water, Bay of San Francisco; creeping and forming large patches.—The species of this genus are so difficult to determine in the dried state, that we are by no means certain this one is rightly named; but this is the name adopted in the Botany of Whipple's Expedition. It occurs also near San Diego, together with an undetermined species allied to *M. crystallinum*. They can hardly be indigenous in California, and yet there is no record of their having been introduced in any other part of the world.

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## ORD. 33. CUCURBITACEÆ.

### 1. ECHINO CYSTIS, *Torr. & Gray.*

#### 1. ECHINO CYSTIS (MEGARHIZA) FABACEA, *Naudin.*

*Echinocystis fabacea*, Naudin, in Ann. Sci. Nat. ser. 4, 16, p. 187; Benth. & Hook. Gen. Pl. 1, p. 835.

*E. muricata*, Kellogg, in Proceed. Calif. Acad. 1, p. 57, olim

*Marah muricatus*, Kellogg, l. c. p. 38.

*Sicyos angulatus*, Hook. Fl. Bor.-Am. 1, p. 220, pro parte.

*S. Oreganus*, Torr. & Gray, Fl. 1, p. 543.

HAB. From Nisqually, Puget Sound, to San Francisco; and, indeed, throughout the length of California.—The root is shaped like a

ruta-baga turnip, and is sometimes larger than a flour barrel. Sometimes it is washed out of river banks and from the sides of ravines by rains or freshets. It is fleshy, very bitter, and leaves a pungent sensation in the mouth and fauces when chewed. Medicinally it is laxative, and is sometimes used as physic by the natives and miners of California, by whom the plant is called *Big-root*, *Giant-root*, and *Physic-root*.

[This remarkable plant was long studied by Dr. Torrey, and indicated by him as a new genus, to which he proposed to give the appropriate name of *Megarhiza*. His long delay of the publication of it was owing to the difficulty he met with in his endeavors to ascertain whether it comprised more than one species, the fruits sent to him in spirit being various in size and form, and especially in the number of ovules and seeds, these varying from one to five in each cell, and when several presenting different forms, perhaps as the result of mutual pressure. On the whole, it is to be gathered from his unfinished notes that he regarded the forms as probably varieties of a single species. In the meantime, Naudin's investigation of the plant as cultivated in France, and his reference of it to the genus *Echinocystis*, came to Dr. Torrey's knowledge, but he did not complete his scattered notes, or leave them in a state available for publication. It is, on the whole, to be inferred that he accepted the view adopted in the Genera Plantarum by Dr. Hooker, namely, that MEGARHIZA forms a marked subgenus, distinguished from true *Echinocystis* by its perennial tuberous root, ovoid turgid seeds, and very thick fleshy cotyledons, which are hypogæous in germination. It is to be noticed that Dr. Kellogg's name *Marah* is much the earliest, but Dr. Torrey objected to it as neither a native nor a personal name, nor one derived from either Greek or Latin.]



## O R D. 34. G R O S S U L A C E Æ.

### 1. R I B E S, *Linn.*

#### 1. RIBES MENZIESII, *Pursh.*

HAB. Around the Bay of San Francisco, California.—A very ornamental species, remarkable for its stout ternate spines, which are united at the base, and for the Fuschia-like flowers.

#### 2. RIBES CALIFORNICUM, *Hook. & Arn.*

*Ribes Californicum*, Hook. & Arn. Bot. Beech. p. 346; Torr. & Gray, Fl. p. 548; Gray, in Bot. Whipl. Rep. p. 88.

*R. subvestitum*, Hook. & Arn. l. c.; Torr. & Gray, l. c. p. 545.

*R. occidentale*, Hook. & Arn. l. c.; Torr. & Gray, l. c. p. 548.

HAB. Port Discovery, Puget Sound; in woods; rather rare.—A variable species, with handsome bright purple flowers and neat foliage. It occurs as far southward as San Francisco.

#### 3. RIBES DIVARICATUM, *Dougl.*

*Ribes divaricatum*, Dougl. in Lond. Hort. Trans. 7, p. 515; Lindl. Bot. Reg. t. 1359; Hook. Fl. Bor.-Am. 1, p. 231; Torr. & Gray, Fl. 1, p. 547.

*R. villosum*, Nutt. in Torr. & Gray, l. c.

HAB. Port Discovery, Puget Sound, and eastward to the Columbia.—This is, perhaps, the tallest North American species of *Ribes*. It is sometimes 12 feet or more in height. The branches are without bristles, and the spines (which are solitary) not remarkably stout.

Peduncles mostly 3- (rarely 4-) flowered. Flowers purple, mixed with green. The lobes of the calyx are reflexed in only a few of the flowers. Petals very much dilated and almost lunate at the summit, with an obtusely cuneate base about half the length of the calyx-lobes. Stamens longer than the calyx. Style 2-cleft about one-third of its length. Ovary ovate, smooth. Fruit not collected.

4. *RIBES LACUSTRE*, *Poir.*

HAB. Puget Sound, and east to the Cascade Mountains.—The western differs from the eastern plant in the rather broader petals and shorter hairs of the ovary, but there seems to be no other difference.

5. *RIBES RUBRUM*, *Linn.*

HAB. Interior of Washington Territory, east of the Cascade Mountains.—There is but a single specimen of this plant in the collection, but there can be little doubt of its identity with the common Red Currant. It extends nearly across the northern part of our continent, but has not been found south of latitude 40°.

6. *RIBES CEREUM*, *Dougl.*

HAB. On rocks and in sheltered situations; common in the interior of Oregon and Washington Territory. It occurs eastward to the Rocky Mountains and southward to New Mexico.—The waxy dots on the leaves are extremely minute, and are not always white, but often brownish, or sometimes confluent into a thin varnish. Fruit yellowish. Bracts unusually large for this genus; often incisely toothed at the summit.

7. *RIBES HIRTELLUM*, *Michx.*?

HAB. Rocky places in the open country, and in river-valleys between Spokane River and Fort Colville, Washington Territory.—Branches almost unarmed, the spines being few and very short.

Leaves an inch or an inch and a half in diameter, 3-5-lobed; the lobes laciniately and rather acutely toothed, nearly smooth above, somewhat pubescent underneath. Peduncles short, 2-3-flowered; bracts oblong. Calyx tubular-campanulate, the lobes longer than the tube, oblong. Petals scarcely half the length of the calyx, rhombic-spatulate. Stamens rather shorter than the calyx. Style deeply 2-cleft, hairy below. Ovary smooth. Berry yellow.

8. *RIBES BRACTEOSUM*, *Dougl.*

HAB. Banks of rills in woods, Puget Sound, and eastward to the Cascade Mountains.—Leaves 3 to 7 inches in diameter, thin. Racemes loose, 6 to 10 inches long, bearing 30 to 40 small greenish flowers. Calyx-segments roundish-ovate, more than twice the length of the broadly rhomboidal petals. Style smooth.

9. *RIBES SANGUINEUM*, *Pursh.*

HAB. Shores of Puget Sound; also about Vancouver, and on the Kootenai.—This is one of the most abundant and ornamental of the Wild Currants of Northwest America. It occurs nearly to the southern borders of California.

10. *RIBES MALVACEUM*, *Smith.*

HAB. On the Upper Columbia, Washington Territory, and southward to San Francisco. It is a common species in California.

11. *RIBES AUREUM*, *Pursh.*

HAB. Interior of Oregon and Washington Territory.—The well-known *Buffalo Currant*.

## ORD. 35. CRASSULACEÆ.

### 1. ECHEVERIA, DC.

#### 1. ECHEVERIA LANCEOLATA, Nutt. in Torr. & Gray.

HAB. Bay of San Francisco, California; on rocks.—Scape-like stem 8–18 inches long. Radical leaves  $1\frac{1}{2}$  to 2 inches long. Cyme more or less compound; the pedicels about half the length of the flowers.—We know nothing of *E. cæspitosa*, which is said to be a California species. It has never been found by any of the modern explorers of that country, and we think it must belong to Lower California.

### 2. SEDUM, Linn.

#### 1. SEDUM SPATHULIFOLIUM, Hook.

HAB. Sides of the Cascade Mountains, and eastward to the Columbia.—Stem creeping, with ascending branches, 3 to 6 inches high. Leaves scarcely one-third of an inch long, varying from obovate to spatulate. Pedicels one or two lines long.

#### 2. SEDUM SPARSIFLORUM, Nutt.?

HAB. On the Upper Columbia.—This plant resembles some of our Arkansas specimens of *S. sparsiflorum* in the stem being quite simple, and all of them are erect. There are often six carpels. According to Dr. Pickering, the flowers are yellow.

3. SEDUM DOUGLASHII, *Hook.*

HAB. On rocks; Upper Columbia and Kooskooskee Rivers.—The root seems to be decidedly perennial in our specimens; but Hooker described it as annual. The stem often bears on its upper half, and sometimes on the lower portion also, short bud-like branches, with imbricated leaves and rudimentary cymes at the summit. When this is the case, the proper terminal cymes are small and few-flowered.

4. SEDUM STENOPETALUM, *Pursh.*

HAB. Upper part of the Columbia River; also found east of the Rocky Mountains.

3. TILLÆA, *Michx.*1. TILLÆA ANGUSTIFOLIA, *Nutt. in Torr. & Gray.*

HAB. Margin of ponds near San Francisco, California.—A very small species, creeping in the mud. Carpels 10–12-seeded. Seeds linear-oblong, striated longitudinally.

## ORD. 36. SAXIFRAGACEÆ.

1. SAXIFRAGA, *Linn.*1. SAXIFRAGA INTEGRIFOLIA, *Hook.*

HAB. Puget Sound; in prairies and wet ground.—The leaves vary from ovate to narrowly oblong. The longer-leaved forms resemble *S. Pennsylvanica*.

2. SAXIFRAGA NIVALIS, *Linn.*

HAB. Subalpine and wet places in the interior of Washington Territory.

## 3. SAXIFRAGA PELTATA, Sp. Nov. (Tab. 5.)

S. (BERGENIA) *rhizomate crasso repente; foliis longissime petiolatis erectis amplis peltatis orbiculatis ambitu lobatis et inciso-dentatis membranaceis; scapis nudis apice cymosis glandulosis; calycis tubo brevissimo campanulato, lobis lato-ovatis obtusis; petalis obovato-oblongis; carpellis distinctis.*

*Saxifraga peltata*, Torr. in Benth. Pl. Hartw. p. 311.

*Leptarrhena inundata*, Behr, in Proceed. Calif. Acad. 1, p. 45 & 57.

HAB. Upper Sacramento and its tributaries, along and in the beds of small swift-running streams; not uncommon through the Sierra.—Rhizoma stout and fleshy, strongly marked with the vestiges of fallen petioles. Leaves orbicular; the lamina sometimes more than a foot in diameter; peltate, with a funnel-shaped depression at the insertion of the petiole, unequally 10–14-lobed, the lobes rounded and crenately-serrate: petioles 1 to 2 feet long, roughened with minute dark-brown glands. Scape  $1\frac{1}{2}$  to 4 feet high, naked, or with only a very small leaf at the base of the cyme, roughly glandular like the petioles. Cyme paniculate, 3 or 4 inches in diameter. Calyx nearly free, much shorter than the petals; the lobes somewhat fleshy, oblong, obtuse, at length reflexed, glandularly pubescent. Petals pale rose color, somewhat unequal, obovate-oblong, persistent. Stamens 10, shorter than the petals: filaments subulate from a broad base: anthers suborbicular, 2-celled. Ovaries distinct nearly to the base, rarely 3, broadly ovate, attenuate above into a short thick style; stigma reniform, oblique. Capsule coriaceo-membranaceous, the carpels ovate, inflated, abruptly rostrate with the short persistent style, opening longitudinally the whole length of the ventral suture. Seeds (immature) obovate, the testa apparently conformed to the nucleus.—A remarkable species, but a genuine Saxifraga. The flowers appear

before the leaves are unfolded. According to Dr. Kellogg (l. c.) the tender inner portion of the scapes has somewhat the flavor of apples, and is eagerly sought after and eaten by the Indians.

PLATE 5.—*SAXIFRAGA PELTATA*. Plant with flowers, young leaves, and portion of fruiting cyme. Fig. 1. A flower. 2. The same displayed. 3. Vertical section. 4. Portion of fruit. The details enlarged.

## 2. *PARNASSIA*, *Tourn.*

### 1. *PARNASSIA PARVIFLORA*, *Hook.*

HAB. Moist places along the Klamath River.—Radical leaves ovate, the base attenuated into a long petiole. Scapes 12–16 inches high, very slender, furnished above the middle with a small bract-like leaf. Phalanges of sterile filaments consisting of 12 to 15 slender bristles. Petals on slight claws. Hardly a distinct species from *P. palustris*.

## 3. *HEUCHERA*, *Linn.*

### 1. *HEUCHERA CYLINDRICA*, *Dougl. in Hook.*

HAB. Upper Columbia, Washington Territory, and Birch Bay, Puget Sound. Also Cascade Mountains, Oregon; a smaller and smoother form.—I find no petals, even rudimentary ones, in any of the specimens. The smaller form, from the mountains, approaches so near to *H. glabella* and *H. ovalifolia* of Nuttall, that all should be reduced to one species.

### 2. *HEUCHERA MICRANTHA*, *Dougl.*

HAB. Nisqually, Puget Sound.—The specimens are immature, but they agree very well with *H. micrantha*.

4. *TOLMIEA*, *Torr. & Gray.*1. *TOLMIEA MENZIESII*, *Torr. & Gray.*

HAB. Around Puget Sound, in fertile woods; eastward to the Cascade Mountains.—Calyx unequally 5-cleft; the lobes ovate-lanceolate, three of them longer than the others; tube cleft nearly the whole length between the two shorter lobes. Petals only 4; there being none between the two shorter lobes of the calyx.

5. *TELLIMA*, *R. Brown.*1. *TELLIMA GRANDIFLORA*, *Dougl.*

HAB. Puget Sound; abundant.—Petals conspicuously exserted, cuneate at the base, the lamina cut into 7 to 9 narrow lobes.

6. *LITHOPHRAGMA*, *Torr. & Gray.*1. *LITHOPHRAGMA PARVIFLORA*, *Nutt.*

HAB. Oregon and Washington Territory; not uncommon in prairies from the seacoast to the Rocky Mountains.—This species is variable in size and pubescence, so that probably some of its forms pass into *L. glabra*, Nutt. The specific name is by no means appropriate, for the flowers are commonly as large as in any other species of the genus.

7. *MITELLA*, *Tourn.*1. *MITELLA CAULESCENS*, *Nutt. in Torr. & Gray.*

HAB. Puget Sound.—This must be a very rare plant, as it has hitherto been found only by Mr. Nuttall and Dr. Pickering. [Re-



cently collected by E. Hall in Oregon.] There are usually but two cauline leaves. The petals are deeply pinnatifid, with five pairs of filiform distant lobes. Stamens shorter than the lobes of the calyx. Capsule opening at the summit very soon after the fertilization of the ovules.

2. *MITELLA PENTANDRA*, *Hook.*

HAB. Oregon; the particular station not recorded, but probably on the Columbia River.

8. *TIARELLA*, *Linn.*

1. *TIARELLA TRIFOLIATA*, *Linn.*

HAB. Washington Territory and Oregon, from the seacoast to the Cascade Mountains; frequent in fertile woods.—The cauline leaves are sometimes undivided, or only obscurely three-lobed.

9. *CHRYSO SPLENIUM*, *Tourn.*

1. *CHRYSO SPLENIUM GLECHOMÆFOLIUM*, *Nutt. in Torr. & Gray.*

HAB. Nisqually, Puget Sound.—Differs from *C. Americanum* of the Atlantic States in the numerous distinct teeth of the leaves, but more essentially in the smooth globular seeds.

10. *PHILADELPHUS*, *Linn.*

1. *PHILADELPHUS LEWISII*, *Pursh.*

*Philadelphus Lewisii*, Pursh. Fl. 1, p. 329; Hook. Fl. Bor.-Am. 1, p. 220; Torr. & Gray, Fl. 1, p. 595.

*P. Gordonianus*, Lindl. Bot. Reg. (Misc. 1838, No. 23) & Ser. 2, t. 32.

*P. Californicus*, Benth. Pl. Hartw. p. 309.

HAB. Puget Sound, and interior of Washington Territory and Oregon, extending into California; abundant along rivers; growing

sometimes 15 feet high.—We unite, under the oldest name, the three species here enumerated, because they seem to pass by insensible gradations into each other. According to Dr. Pickering the flowers (at least in the Oregon plant) are by no means inodorous, as stated in the Flora of North America. He states that they have an extremely grateful odor.

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## ORD. 37. UMBELLIFERÆ.

### 1. HYDROCOTYLE, *Tourn.*

#### 1. HYDROCOTYLE RANUNCULOIDES, *Linn.*

HAB. Around the Bay of San Francisco, California; in wet ground.—This species occurs in all the southern parts of the United States, across the whole continent, and is common also in Mexico and South America.

### 2. CRANTZIA, *Nutt.*

#### 1. CRANTZIA ATTENUATA, *Hook. & Arn.*

*Crantzia attenuata*, Hook. & Arn. in Hook. Bot. Misc. 3, p. 346.  
*C. Schaffneriana*, Schlecht. in Linnæa, 26, p. 370?

HAB. Wet places, Puget Sound.—A much larger plant than *C. lineata*. Stem creeping and rooting in the mud. Leaves 3 to 6 inches long, terete, with distant and slightly constricted nodes, 2 or 3 lines in diameter, gradually attenuated towards the summit, which is never-

theless rather obtuse. Peduncles scarcely one-fourth the length of the leaves. Umbels 10–15-flowered, the pedicels 3 or 4 lines long. Involucre of 5 or 6 very short ovate leaflets. Fruit not sufficiently mature for examination. This species occurs also at Buenos Ayres, where it was first detected by Tweedie. The little known *Hydrocotyle Chinensis*, Linn. Sp. p. 339, is by some botanists thought to be the same as *H. lineata*, Michx. The description of Linnæus applies very well to the plant of the United States, except that the leaves are said to be flat. So indeed they appear to be in dried specimens of *H. lineata* and *H. attenuata*.

### 3. SANICULA, *Tourn.*

#### 1. SANICULA MARILANDICA, *Linn.*

HAB. Washington Territory, between Puget Sound and the Cascade Mountains.—A very uncommon species on the western side of the continent.

#### 2. SANICULA MENZIESII, *Hook. & Arn.*

HAB. Puget Sound, Washington Territory; the var. *obtusa*, viz., *S. obtusa*, Nutt. in Herb.

#### 3. SANICULA BIPINNATIFIDA, *Dougl. in Hook.*

HAB. Port Discovery, Washington Territory.—Roots thick and blackish. Umbels about half an inch in diameter, so densely flowered as to appear capitate. Flowers mostly sterile, brownish-purple. Styles as long as the ovary and recurved.

#### 4. SANICULA PINNATIFIDA, *Hook. & Arn.*

HAB. Washington Territory, from Puget Sound to the Cascade Mountains.—Differs from the California plant, on which the species

was founded, in the lobes of the leaves being rather obtuse, the primary rays of the umbel shorter, and the umbellets 8–10-flowered; thus approaching *S. graveolens* of Chili more closely than does the ordinary variety.

#### 4. ERYNGIUM, *Thurn.*

##### 1. ERYNGIUM PETIOLATUM, *Hook.*

*E. caule superne dichotomo; foliis radicalibus oblongo-lanceolatis grosse serrato-dentatis, denticulis spinosis vel piliferis, petiolis longissimis fistulosis septiferis, caulinis sessilibus, supremis tripartitis spinosis, involucralibus paleisve pinnatifido- vel tricuspidato-spinosis capitulo subgloboso longioribus.*

*Eryngium petiolatum*, Hook. Fl. Bor.-Am. 1, p. 259; Torr. & Gray, Fl. 1, p. 604.  
*E. articulatum*, Hook. Lond. Jour. Bot. 6, p. 232.

HAB. On the Spokane River, Washington Territory. Also on the Willamette River, Oregon, and southward to the Lower Sacramento, California.—Variable in size, but often 3 to 5 feet high, the upper part dichotomously much branched; the stem and branches striate. Sometimes the plant is a few inches high, and branching from the base. The radical leaves are often destitute of lamina, and then consist of terete petioles which are 12–18 inches long and as thick as a goose-quill. They have a jointed appearance from the nodes which occur at intervals of an inch or more. Even when the lamina is present, the petioles have the same structure, except that the nodes are much more approximated. The primary veins mostly originate at the base of the lamina, and run nearly parallel towards the summit. The heads (including the projecting spiny scales) are about three-fourths of an inch in diameter, and are often of a bluish color. Sometimes only the scales of the terminal flowers are elongated. Calyx-tube covered with ovate acute scales.—A remarkable species, varying considerably according to soil and situation. I have no hesitation in joining with it *E. articulatum* of Hooker, so well described by him in

his account of Geyer's collection. It seems to be most allied to *E. corniculatum* of Spain and Portugal. The character of *E. petiolatum* in the Flora of North America was drawn from dwarf specimens collected by Nuttall.

Imperfect specimens of another *Eryngium*, collected near San Francisco, are in the collection, and I have it from the same place, sent to me by Dr. Andrews. It may be an abnormal form of *E. petiolatum*; but the involucral leaves and scales are all lanceolate and entire, with a strong marginal nerve. The heads are larger also, but the flowers are few.

## 5. C I C U T A, *Linn.*

### 1. C I C U T A M A C U L A T A, *Linn.*

HAB. Wet places, interior of Washington Territory.—Leaves not so membranaceous as in the plant of the Atlantic States. Involucels of many lanceolate leaflets. Styles nearly as long as the ovary. Mr. Nuttall considered this a distinct species from *C. maculata*, and named it *C. crassifolia*, in my herbarium; but I cannot find sufficient characters for separating it, even as a well-marked variety. The veining of the leaves is the same in both. I have not seen the mature fruit of the western plant.

## 6. S I U M, *Linn.*

### 1. S I U M L I N E A R E, *Michx.*

HAB. Valley of the Sacramento, California.—A stout plant, 2–3 feet high. Leaves narrowly lanceolate, with mostly salient teeth. Involucral leaves linear-lanceolate, about half as long as the rays. Except in the longer involucre there are no obvious characters in which it differs from the eastern plant.

7. BERULA, *Koch.*

1. BERULA ANGUSTIFOLIA, *Koch.*

*Berula angustifolia*, Koch. Fl. Germ. & Helv. 2, p. 317? Gray, Pl. Fendl. p. 55, & Pl. Wright. 2, p. 65.

*Sium angustifolium*, Linn. Sp. ed. 2, p. 1672.

*S. pusillum*, Nutt. in Torr. & Gray, Fl. 1, p. 611 (forma depauperata).

*S. incisum*, Torr. in Frem. 1st Rep. p. 90.

HAB. Near San Francisco; in wet grounds.—I find no considerable difference between this plant and the European *B. angustifolia*, except that the fruit is broader in proportion to its length in the latter than in the former. The specimens in the herbarium of the Exploring Expedition are clearly the same as *Sium pusillum* of Nuttall, which we have, named by that botanist. It is remarkable that this plant, which occurs in so many places, from Michigan to Florida, and west to the Pacific, should not have been identified until within a few years.

8. PEUCEDANUM, *Koch.*

1. PEUCEDANUM LATIFOLIUM, *Nutt. in Torr. & Gray.*

HAB. Washington Territory, from the Columbia River westward to the Cascade Mountains.—Whole plant glaucous. Stem 1 or 2 feet high. Petioles 5 to 8 inches long. Segments of the leaves sometimes 2½ inches wide and more than 3 inches long. Peduncles a foot long. Rays of the umbel 3 to 7 inches long. The fruit is not mature.

2. PEUCEDANUM LEIOCARPUM, *Nutt.*

HAB. Oregon and Washington Territory; also northward to British Columbia.—In the Botany of Whipple's Report I expressed the

suspicion that a broad-leaved Californian form of this species may show that *P. latifolium* is not distinct, but we have not yet sufficient materials for determining the question.

### 3. PEUCEDANUM TRITERNATUM, Nutt.

HAB. Upper Columbia and Kooskooskee, and in Oregon; common on hillsides and prairies; also var. *leptocarpum*, Torr. & Gray (*P. leptocarpum*, Nutt. in Torr. & Gray); common on elevated stony land in the Nez Perces country.—The root is subglobose or oblong, and varies from one inch to four inches in diameter. The natives call it *Kamshit* when fresh, and *Kanash* (*Biscuit-root*) when dry. It constitutes a principal article of their food. They dry it in the sun after peeling off the dark skin, and sometimes pound it into flour and then make it into cakes. Hundreds of bushels of the root are gathered every year in May, according to the Rev. Mr. Spalding.

### 4. PEUCEDANUM? AMBIGUUM, Nutt.

*Eulophus ambiguus*, Nutt. in Jour. Acad. Philad. 7, p. 27.

*Peucedanum ambiguum*, Nutt. in Torr. & Gray, Fl. 1, p. 626.

*P. farinaceum*, Hook. Pl. Geyer, in Lond. Jour. 6, p. 235?

HAB. Washington Territory, east of the Cascade Mountains, and on the Kooskooskee River.—The root is globose, and from half an inch to an inch in diameter. As in many other species of the genus, it is farinaceous, and a wholesome article of food. According to Mr. Spalding, the aboriginal name of it is *Lakaptat*. The description of *P. farinaceum*, Hook., applies very well to our plant, except that the flowers are white, while Nuttall states that they are yellow in his plant. The description of his plant was made from dried specimens collected by Wyeth (one of which I have), and they may have been white when living.

### 5. PEUCEDANUM FENICULACEUM, Nutt.

HAB. Between the Cascade Mountains and the Columbia River,

Washington Territory. The root is edible, and is called *Imakai* by the Nez Perces Indians.

6. PEUCEDANUM MACROCARPUM, *Nutt.*

HAB. Upper Columbia, and on the Kooskooskee; in stony places.—Flowers white, appearing in February. Root edible, and called *Yikan* by the Nez Perces Indians. *P. dasycarpum*, Torr. & Gray, and *P. tomentosum*, Benth., are probably only varieties of this species, which again may not be distinct from *P. fœniculaceum*.

7. PEUCEDANUM UTRICULATUM, *Nutt.*

HAB. Prairies of the Walla-Walla and other parts of Oregon; southward to California.—The specimens are without fruit, but they evidently belong to this species.

8. PEUCEDANUM NUDICAULE, *Nutt.*

HAB. On the Kooskooskee River, Rev. Mr. Spalding.—Root a globose farinaceous tuber, about three-fourths of an inch in diameter, blackish externally. The aboriginal name of it is *Kaket*. The fructiferous peduncle is about a foot long. The oil-tubes of the fruit (one in each interval and four in the commissure) are very slender.

9. LEPTOTÆNIA, *Nutt.*

1. LEPTOTÆNIA DISSECTA, *Nutt.*

HAB. Upper Columbia and Spipen Rivers, and in the Nez Perces country; in rich prairies and on hillsides; flowering in March and April.—The root is large and round, and acrid in taste. The Rev. Mr. Spalding states that the Nez Perces Indians call it *Itsis*. The ripe fruit



resembles a watermelon seed. We have not seen original specimens of Nuttall's *L. multifida*, but have little doubt that it is only a yellow-flowered variety of this species. Although the flowers are commonly brownish-purple, some of these specimens are yellow, and the length of the pedicels of the fruit does not seem to be constant.

# 10. EDOSMIA, *Nutt.*

## 1. EDOSMIA GAIRDNERI, *Torr. & Gray.*

HAB. Valley of the Kooskooskee, Washington Territory, and dry hillocks near San Francisco, California.—The tuberous root is about the thickness of a man's thumb, and is a very wholesome article of food.

# 11. THASPIUM, *Nutt.*

## 1. THASPIUM TRIFOLIATUM, var. APTERUM, *Gray.*

*Thaspium trifoliatum*, var. *apterum*, Gray, Man. Bot. ed. 2, p. 156.

*Zizia cordata*, Koch; DC. Prodr. 4, p. 99; Torr. Fl. New York, 1, p. 270, t. 33.

HAB. Upper Columbia, Washington Territory.—Except in the smaller radical leaves, more incised cauline leaflets, and longer peduncles, there appears to be nothing to distinguish this from the eastern plant.

# 12. ŒNANTHE, *Linn.*

## 1. ŒNANTHE SARMENTOSA, *Presl.*

*Œnanthe sarmentosa*, Presl in Herb. Hænk., fide DC. Prodr. 4, p. 138; Nutt. in Torr. & Gray Fl. 1, p. 617.

HAB. Puget Sound, and west to the Upper Columbia, north to Fraser's River.—The young stalks have the taste of celery, and were

eaten by the exploring party. Allied to *Æ. apiifolium* of Europe. Nuttall and Presl hit upon the same name.

### 13. CONIOSELINUM, *Fisch.*

#### 1. CONIOSELINUM FISCHERI, *Wimm. & Grab.*

HAB. Puget Sound, on wooded banks.—Plant 3 to 5 feet high; resembles wholly a Russian specimen of *C. Ingricum*, Fischer, which is referred to *C. Fischeri*.

### 14. DAUCUS, *Tourn.*

#### 1. DAUCUS PUSILLUS, *Michx.*, var. MICROPHYLLUS, *Torr. & Gray.*

HAB. Oregon and California; common in various places.

### 15. PHELLOPTERUS, *Benth. & Hook.*

#### 1. PHELLOPTERUS LITTORALIS, *Gray ex Schmidt.*

*Phellopterus littoralis*, [Benth. & Hook. Gen. Pl. p. 905.] Gray ex Schmidt.

Fl. Sachalin, in Mem. Acad. Petrop., ser. 7, 12, p. 138.

*Glehnia littoralis*, Schmidt in Miquel, Prolus. Jap.

*Cymopterus?* *littoralis*, Gray in Mem. Am. Acad. 6, p. 391, & in Pacif. R.R. Exped. (Stevens's Rep., 12, part 2, p. 62.)

HAB. Sandy shore of Dungeness Point, and at Gray's Harbor, Washington Territory.—Root very long, and about one-third of an inch thick. Caudex 1 to 3 inches long, more or less buried in the sand. Leaves mostly radical, of a thickish texture, simply ternate, with the divisions deeply 3-5-lobed, or biternate. The leaflets ovate or obovate, crenate-serrate, the terminal one mostly 3-lobed, smooth above, but very densely tomentose with a soft pubescence underneath. Peduncles about an inch long. Umbel compound, of 6 to 8 rays, which are 1 to 2 inches long, and pubescent. Involucre none. Umbellets of many

short rays. Leaflets of the involucels narrow and numerous. Calyx-teeth lanceolate, conspicuous, erect, or reflexed. Petals apparently white, broadly obovate with an inflexed point. Stylopodium much depressed. Styles short and recurved. Fruit broadly oblong in outline, nearly half an inch long. Carpels dorsally compressed; the dorsal ribs strongly winged, nearly as broad as the lateral ones, all of the wings thick and somewhat corky. Commissure flat. Seeds moderately concave on the face. Dorsal vittæ adhering to the surface of the seed, usually 10, but sometimes 9, 11, or 13; those of the commissure very generally 4.

This remarkable species appears to be very rare. We have received it only from the places here noticed. [Dr. Cooper collected it at Shoalwater Bay in the same region. Mr. Charles Wright, still earlier, on the coast of the Loo Choo Islands, and finally, Glehn and Maximowicz on the shores of Japan, Sachalien, &c. The name of *Glehnia* was first given to it, but no character published, which is fortunate, as that is too near *Glennia* of Hooker.]

## 16. CYMPTERUS, Nutt.

### 1. CYMPTERUS TEREBINTHINUS, Torr. & Gray.

HAB. On the Walla-Walla River; in sandy places; common.—The stem is somewhat branching, with very long fructiferous peduncles. One of the carpels has a single broad and two narrow wings; the other two broad and one narrow one. The same diversity occurs in several other species of this genus.

## 17. ANGELICA, Linn.

### 1. ANGELICA GENUFLEXA, Nutt. in Torr. & Gray.

HAB. Puget Sound.—Resembles *Archangelica atropurpurea*, but is a true *Angelica*. It is a tall, coarse species. Leaves ternately divided;

the divisions ternate and pinnately quinate, or biternate. Ultimate segments 2-4 inches long. Umbel of very numerous rays. Involucre none. Involucel of about nine very narrow leaves. Fruit immature, but the vittæ evidently single in each interval.

2. *ANGELICA ARGUTA*, *Nutt. in Torr. & Gray.*

HAB. Mountains of Northern California, towards the sources of the Sacramento.—A more slender plant than *A. genuflexa*. It is entirely smooth. Leaflets about three times longer than broad, tapering to the summit, rather acutely angular at the base. Peduncles elongated; the common base subtended by large inflated petioles, which are nearly destitute of lamina. Rays very numerous and slender. Involucre and involucels none. Fruit nearly 5 lines long, elliptical-oblong, the dorsal ribs slightly prominent. Vittæ solitary in the intervals, and usually four in the commissure. Our plant differs from an original specimen of Nuttall's in the narrower and longer leaflets, and smaller remote serratures.

There are specimens in the collection of an *Angelica*, collected by Rev. Mr. Spalding on the Kooskooskee, which seem almost intermediate between the two species here noticed. It has the leaves of *A. genuflexa*, and the umbels of *A. arguta*, but the fruit being wanting it cannot be certainly determined.

18. *HERACLEUM*, *Linn.*

1. *HERACLEUM LANATUM*, *Michx.*

*Heracleum lanatum*, Michx., Fl. 1, p. 166; Torr. & Gray, Fl. 1, p. 632.

HAB. Interior of Oregon (var. *VESTITUM*), Puget Sound, and near San Francisco.—Except in the more softly pubescent leaves, and villous peduncles and branches, the Oregon plant differs in no respect from the Californian specimens.

## 19. OSMORHIZA, Raf.

## 1. OSMORHIZA NUDA, Torr.

*Osmorhiza nuda*, Torr. Bot. Whipl. in Pacif. R. Road Expl. 4, p. 93.

*O. brevistylis*, Hook., Fl. Bor. Am. 1, p. 271, ex parte; Torr. & Gray, Fl. 1, p. 638, ex parte.

*O. divaricata*, Nutt. MSS.

HAB. Puget Sound and Oregon.—I was not aware when the description of *O. nuda* was published that it was identical with the plant of Oregon, which all our botanists, as well as Hooker, had regarded as *O. brevistylis*, or I should have adopted Nuttall's manuscript name. But it is too late now to change it. The involucre and involucel are wanting, or else caducous, before the flowers are quite expanded, while they are always present in *O. brevistylis* until the fruit begins to ripen.

## 2. OSMORHIZA OCCIDENTALIS.

*Glycosma occidentalis*, Nutt. in Torr. & Gray, Fl. 1, p. 639.

HAB. Between Puget Sound and the Cascade Mountains; in woods, and on high and shady banks. Flowers in May.—There is little to distinguish *Glycosma* from *Osmorhiza* except the smooth fruit, which is not a character of generic importance. [A different view is taken in Benth. & Hook., Gen. Pl., where the *Glycosma* is referred to *Myrrhis*; but in Proc. Am. Acad. 8, p. 386, the genus is restored and characterized.]

## ORD. 38. ARALIACEÆ.

### 1. ARALIA, *Tourn.*

#### 1. ARALIA NUDICAULIS, *Linn.*

HAB. On the Upper Columbia, between Spokane River and Fort Colville; in woods.—Larger than the eastern plant, and the lower pair of leaflets petiolulate. Angles of the (scarcely mature) fruit almost winged in the dry state. This species has not been hitherto recorded as a native of the Pacific side of the continent.

#### 2. ARALIA RACEMOSA, *Linn.*

Var. OCCIDENTALIS: *foliis tenuioribus; calycis dentibus late triangularibus.*

HAB. Upper tributaries of the Sacramento, California.—Differs from the eastern plant in its very thin leaves, and shorter as well as much broader teeth of the calyx. It may prove to be a distinct species.

### 2. ECHINOPANAX, *Decaisne & Planchon.*

#### 1. ECHINOPANAX HORRIDUM, *Decaisne & Planchon.*

HAB. Puget Sound, and southward to the Columbia River; in moist woods.—This genus was established by the authors cited above, in the *Revue Horticole* for 1854, for the *Panax horridum* of Smith, Hooker, &c. It was made a sub-genus, *Oplopanax*, in the *Flora of North America*.

## O<sub>R</sub>D. 39. CORNACEÆ.

### 1. CORNUS, *Tourn.*

#### 1. CORNUS PUBESCENS, *Nutt.*

*Cornus pubescens*, Nutt. in Torr. and Gray, Fl. 1, p. 652 (sub var. *sericea*) and Sylv. 3, p. 54; Torr. in Pacif. R. Road Exped., 4 (Bot. Whipl.), p. 95.

HAB. Puget Sound, and Upper Columbia River, southward to San Francisco; in moist, rich soil.—It attains the height of 12 to 15 feet. The twigs are dark red. Nearer to *C. alba* than to *C. sericea*.

#### 2. CORNUS NUTTALLII, *Audubon.*

*Cornus Nuttallii*, Audub. Birds of America, t. 367; Torr. & Gray, Fl. 1, p. 652; Nutt. Sylv. 3, p. 51, t. 97.  
*C. florida*, Hook. Fl. Bor.-Am. 1, p. 277 (partim).

HAB. Common in woods around Puget Sound, and on the Columbia and Kooskooskee Rivers; also on the Sacramento, California.—A very distinct species from the Flowering Dogwood of the Eastern States. The leaflets of the involucre, although commonly six in number, are often only four or five. The number of flowers in a head is three times greater than in *C. florida*, and the calyx and lobes are longer, as well as thicker, and somewhat carinate on the back. Trees of this species sometimes attain the height of 60 feet.

#### 3. CORNUS CANADENSIS, *Linn.*

HAB. Valley of the Columbia, and about Puget Sound.—This beautiful little species extends quite across the continent, and from latitude 40° to the Arctic Regions.

## ORD. 40. CAPRIFOLIACEÆ.

### 1. LINNÆA, Gronov.

#### 1. LINNÆA BOREALIS, Gronov.

Var. LONGIFLORA: *corollæ tubo basi longe attenuatis; calycis lobis lineari-subulatis ovario triplo longioribus.*

HAB. Oregon, and northward to British Columbia and Sitcha, eastward to the Rocky Mountains.—We find no constant differences between the western *Linnæa* and the ordinary state of the plant, except what we have here noticed. The flower is indeed larger, but is sometimes equalled in New England specimens. The eastern *Linnæa* is wholly like that of Europe, and so is that from Amoor River, from Kamtschatka, &c., of which there are specimens in the herbarium of Dr. Gray. [In Lyall's, E. Hall's, and other specimens from Oregon and Washington Territory, this character holds good; while at Fraser River an intermediate form occurs. From Utah and the Rocky Mountains only the ordinary form has been collected.]

### 2. SYMPHORICARPUS, Dill.

#### 1. SYMPHORICARPUS RACEMOSUS, Michx.

HAB. Washington Territory and Oregon; common on the borders of woods and banks of rivers; also near San Francisco, where it attains the height of from 6 to 8 feet.



2. SYMPHORICARPUS MOLLIS, *Nutt.*?

HAB. Washington Territory east of the Cascade Mountains.—A remarkable variety, apparently, of this species (which includes *S. ciliatus*, Nutt.), with narrow, almost lanceolate, and acute leaves. The flowers are hardly enough developed in the single specimen.

3. LONICERA, *Linn.*1. LONICERA CILIOSA, *Poir.*

*Lonicera ciliosa*, Poir. Dict. 5, p. 612; Torr. & Gray, Fl. 2, p. 5.

*L. occidentalis*, Hook., Fl. Bor.-Am. 1, p. 282, Torr. & Gray, l. c.

*Caprifolium ciliosum*, Pursh., Fl. 1, p. 160.

*C. occidentale*, Lindl. Bot. Reg. t. 1457.

HAB. Puget Sound, and along the Columbia River and its tributaries; southward as far as Klamath River.—Leaves (including the short petiole) 3 to 4 inches long, and 1½ to 2 inches wide, conspicuously glaucous underneath, ciliate on the margin, particularly towards the base; the upper ones connate-perfoliate. Flowers in simple or verticillate clusters. Corolla golden-yellow, 1½ inch long, smooth, somewhat bilabiate; the tube gibbously inflated above the base, and somewhat pubescent. Stamens a little exserted.

Our plant does not agree in all respects with the description of Pursh, and yet there can be little doubt of its being his *Caprifolium ciliosum*. The tube of the corolla is not inflated in the middle, but towards the base. This species belongs rather to the *Caprifolium* group than to *Periclymenum*.

2. LONICERA HISPIDULA, *Dougl.*

*Lonicera hispidula*, Dougl. in Hook., Fl. Bor.-Am. 1, p. 283; Torr. & Gray, Fl. 2, p. 8.

*L. microphylla*, Hook., l. c., non Willd.

*Caprifolium hispidulum*, Lindl. Bot. Reg. t. 1761.

HAB. Puget Sound, Washington Territory, and near San Francisco,

California.—All the specimens are without flowers. The California plant has the leaves nearly twice as large as in the specimens from Puget Sound.

3. *LONICERA CALIFORNICA*, Torr. & Gray.

*Lonicera Californica*, Torr. & Gray, Fl. 2, p. 7.

*L. ciliosa*, Hook. & Arn. Bot. Beechey, p. 143 & 349, non Poir.

*L. interrupta*, Benth. Pl. Hartw., p. 313.

HAB. Near San Francisco, California; in fruit only.—The degree of gibbosity of the tube of the corolla is not constant. *L. interrupta*, Benth., seems to differ only in the glabrous flowers.

4. *LONICERA INVOLUCRATA*, Banks.

HAB. San Francisco, and in the Sacramento Valley, northward to Fraser's River; common along streams in fertile soil.—A stout shrub, growing from 6 to 8 feet high. It has rather a showy appearance when in fruit; the black berries being surrounded by a large red involucre.

4. *VIBURNUM*, Linn.

1. *VIBURNUM ELLIPTICUM*, Hook.

HAB. Southern Oregon, along the borders of creeks.—Leaves 2 or 3 inches long, on short petioles, broadly ovate, subcordate, very obtuse or truncate at the summit, coarsely dentate-serrate, hairy underneath, nearly smooth above, with 5 primary veins which arise from the base. Fruit black, about one-third of an inch long, ovate-globose (much compressed when dry), the pulp thin. This species, on the western coast, takes the place of the eastern *V. dentatum*, or rather, perhaps, of *V. pubescens*, which it more resembles.

2. VIBURNUM PAUCIFLORUM, *Pylaie, Torr. & Gray.*

HAB. Washington Territory; along rivers in mountainous places; not common.

5. S A M B U C U S, *Linn.*1. SAMBUCUS RACEMOSUS, *Linn.*

HAB. Puget Sound, Washington Territory; not found in the interior. We agree with Sir William Hooker that this plant, although the *S. pubens* of Michaux, is not specially distinct from the common red-berried European Elder.

2. SAMBUCUS CANADENSIS, *Linn.*

HAB. Interior of Washington Territory, east of the Cascade Mountains.—This differs from the eastern plant in the narrower and less acute, as well as entirely smooth leaflets, but it does not seem to be a distinct species.

3. SAMBUCUS MEXICANA, *Presl?*

*Sambucus Mexicana*, Presl, in DC. Prodr. 4, p. 323, ex Gray, Pl. Wright 2, p. 66.

HAB. California, in the Valley of the Lower Sacramento, and near San Francisco.—Whether this is really Hænke's plant, which may have been collected in California, is uncertain. It is the *S. glauca* of Nuttall.

O<sub>R</sub>D. 41. RUBIACEÆ.

1. GALIUM, *Linn.*

1. GALIUM TRIFIDUM, *Linn.*, var. TINCTORIUM, *Torr. & Gray.*

HAB. Gray's Harbor, and other parts of Washington Territory west of the Cascade Mountains.

2. GALIUM TRIFLORUM, *Michx.*

HAB. Puget Sound, in woods, and in the interior of Washington Territory; also near San Francisco, California.

3. GALIUM BOREALE, *Linn.*

HAB. Upper Columbia and its tributaries; common in moist prairies.

4. GALIUM APARINE, *Linn.*

HAB. Wooded region around Puget Sound, very abundant on the Kooskooskee River.

5. GALIUM CALIFORNICUM, *Hook. & Arn.*

HAB. Near San Francisco, California.—Two forms occur in the collection; one with small, smoothish leaves; the other with much larger and hairy leaves. The fruit of the latter is hispid.

## 2. KELLOGGIA, Nov. Gen.

*Calycis tubo obovato-didymo, cum ovario connato; limbo brevissimo quadridentato persistente. Corolla infundibuliformis; tubo elongato; limbo quadrifido; lobis oblongo-lanceolatis. Stamina 4, corollæ tubo inserta: filamenta filiformia: antheræ oblongo-lineares, erectæ. Styli fere ad apicem concreti, longitudine staminum: stigmata oblongo-linearia: ovarium obovato-didynum, biloculare; loculis uniovulatis. Ovula erecta, anatropa. Fructus obovato-didymus, siccus; coccis rectis facile separabilibus indehiscentibus. Semen a pericarpio vix solutum. Embryo intra albumen corneum rectus; cotyledonibus foliaceis lateribus subincurvis; radícula elongata infera.—Herba gracilis, perennis, erecta, ramosa, glabra; ramulis obtuse quadrangularibus; foliis oppositis; stipulis brevissimis coadunatis; cymis divaricato-trichotomis; pedicellis elongatis sub flore incrassatis.*

## 1. KELLOGGIA GALIODES, Sp. Nov. (Tab. 6.)

HAB. Walla-Walla River: now known southward through the foot-hills and Sierra Nevada to Mariposa County, California; in open woods.—Herb, a foot or so in height, erect, branching loosely or sparsely. Lower leaves are an inch long, varying from lanceolate to linear-lanceolate, entire, rather obtuse. Stipules broad and very short, united nearly or quite to the summit. Cymes terminal, large, widely spreading; the pedicels (when in fruit) nearly an inch in length, much thickened and clavate below the flowers. Flowers small (as in *Asperula*), apparently white. Fruit nearly the size of a peppercorn, oboviform, densely clothed with white uncinuate hairs or bristles; the grains easily separating.

This remarkable and rare plant seems to have escaped the notice of all the botanists and collectors who have visited the valley of the Columbia and its tributaries, except Dr. Pickering and Mr. Brackenridge. Although in habit it would seem to belong to the *Stellateæ*, and has a flower much like that of *Asperula*, yet its true place is in the tribe of *Anthospermææ*, next to *Galopina*, a South African genus. It is dedicated to Dr. Albert Kellogg of San Francisco, one of the earliest and most zealous of botanists resident in California.

PLATE 6. *KELLOGGIA GALIOIDES*: Upper part of the plant, of the natural size. Fig. 1. A portion of stem and two of the leaves, showing the stipules, enlarged. 2. Flower and thickened part of the pedicel, magnified. 3. Upper part of the calyx with the hairs removed showing the 4-toothed border. 4. Corolla laid open to exhibit style and insertion of the stamens. 5. Mature fruit with the adherent calyx. 6. Longitudinal section of the same between the carpels. 7. Uncinate hairs of the calyx. 8. Transverse section of the fruit, above the middle, showing the cotyledonous portion of the embryos. 9. Transverse section of one of the carpels near the base. 10. Embryo. The details enlarged.

### 3. *CEPHALANTHUS*, *Linn.*

#### 1. *CEPHALANTHUS OCCIDENTALIS*, *Linn.*

HAB. California, on the banks of the Sacramento and its tributaries.—There are both broad and narrow-leaved forms in the collection. The latter belong to the var. *brachypodus*, DC. l. c.; and *C. salicifolius*, H. B. K. is probably not distinct. The western plant usually has shorter petioles than the eastern one. The leaves are opposite, ternate, or rarely quaternate.

## ORD. 42. VALERIANACEÆ.

### 1. *VALERIANA*, *Tourn.*

#### 1. *VALERIANA EDULIS*, *Nutt. in Torr. & Gray.*

HAB. Washington Territory, east of the Cascade Mountains, in moist, rocky plains; also in Western Oregon.—This is the famous *Black-root* or *Tobacco-root* of the western Indians. It is thick and

tapering, black externally, with a tough, whitish interior. When baked it is converted into a tolerable food, but is disagreeable to most white people, and has the characteristic strong odor of the genus.

2. VALERIANA CAPITATA, *Willd.*, var. *HOOKERI*, *Torr. & Gray*.

HAB. Washington Territory, west of the Cascade Mountains; in wet places on hillsides; common.

3. VALERIANA SYLVATICA, var. *ULIGINOSA*, *Torr. & Gray*.

HAB. On the Upper Columbia, Washington Territory.—The leaves are quite glabrous (as they are in some other of our specimens of this variety), and the radical ones as well as the cauline are pinnatifid.

2. PLECTRITIS, *Lindl.*

1. PLECTRITIS CONGESTA, *DC.*

HAB. Puget Sound, and interior of Washington Territory; in woods and prairies.—A variable plant, both in size and form of the leaves: sometimes it is short and stout, with broadly obovate leaves, and a single roundish head of flowers; but more frequently it is slender, elongated, with the inflorescence rather loose, in somewhat verticillate distant cymules.

## ORD. 43. COMPOSITÆ.

By ASA GRAY.

### 1. BRICKELLIA, *Ell.*

#### 1. BRICKELLIA CALIFORNICA, *Gray.*

HAB. Valley of the Sacramento, California.—Accords with Douglas's specimens, on which this species was founded, and with others from California.

#### 2. BRICKELLIA OBLONGIFOLIA, *Linn.*

HAB. Oregon and Washington Territory, from the Kooskooskee to the Walla-Walla River.

### 2. ADENOCAULON, *Hook.*

#### 1. ADENOCAULON BICOLOR, *Hook.*

HAB. Nisqually, and elsewhere on the coast of the northern part of Oregon and of Washington Territory.—The geographical distribution of this genus is interesting. It consists of three closely related species, viz.: the present one, which extends eastward in the wooded country to the eastern extremity of Lake Superior; *A. Himalicum*, of the Himalayas; and *A. Chilesne*, of the Chilean Andes.



3. NARDOSMIA, *Cass.*1. NARDOSMIA PALMATA, *Hook.*

*Tussilago palmata*, Ait. Hort. Kew. (ed. 1) 3, p. 188. t. 11.

*Nardosmia palmata*, Hook. Fl. Bor.-Am. 1, p. 308; Torr. & Gray, Fl. 2, p. 93.

*N. palmata*, *Hookeriana*, & *speciosa*, Nutt. in Trans. Amer. Phil. Soc., n. ser. 7, p. 288.

HAB. Port Discovery, Nisqually, Puget Sound, &c.—This species extends on the western side of the continent from Sitcha south to California (where the Russian collectors long ago gathered it, and recently Dr. T. M. Bigelow), and eastward to the New England States, Labrador, and Newfoundland. *N. frigida* has a more northern range, and doubtless includes both *N. corymbosa* and *N. sagittata*. As to the genus, Fries has rightly enough reduced it to *Petasites*, of which it forms merely a radiate section.

4. LESSINGIA, *Cham.*

Char. emend. et auct. *Capitulum* 5–25-florum, homochromum, homogamum; floribus omnibus hermaphroditis seu marginalibus abortu staminum foemineis. *Corollæ* tubulosæ limbo 5-fido, marginales nunc pl. m. ampliatæ et radiantes, limbo aut palmatifido aut regulari, lobis lineari-oblongis æstivatione induplicatis, nervis valde intramarginalibus. *Involucrum* pluriseriale, imbricatum, squamis linearibus appressis apice herbaceis vel acutatis. *Receptaculum* planum, alveolatum. *Antheræ* inclusæ, appendice setacea terminatæ. *Styli* rami lineares, plani (*Asteroidearum*), apice nunc truncato penicillato, nunc in appendicem filiformi-subulatam desinente. *Achenia* compressa, subcuneiformia, sericeo-villosa. *Pappus* simplex, corollæ brevior, setis rigidulis inæqualibus scabris sæpe rufis.—*Herbæ* monocarpicæ, Californicæ, e basi diffuse ramosæ, floccosæ, mox sæpius glabratae, alternifoliae; foliis crassiusculis, caulinis sessilibus; capitulis terminalibus vel axillaribus; floribus luteis deinde purpurascentibus seu albis.

LESSINGIA, Cham. in Linnæa, 4, p. 203, t. 2; Less. Syn. p. 388; DC. Prodr. 5, p. 351; Torr. & Gray, Fl. N. Amer. 2, p. 451; Gray in Benth. Pl. Hartw. p. 314.

This Expedition has brought to light three new and very interesting species of *Lessingia*, which call for a revision and extension of the generic character, as given above. The relationship of the genus with *Corethrogyne*, among the *Asterineæ*, is unquestionable and very close. The principal differences are that the latter has true and heterochromous ligules in place of the ampliate marginal flowers of *Lessingia*, and sometimes a paleaceous receptacle. As already indicated in the *Plantæ Hartwegianæ*, the genus divides into two marked sections. The first, or *Lessingia* proper, has from 18 to 25 flowers in the capitulum, the truncate tips of the branches of the style bear a penicillate tuft of hairs, and one species has an obscure setiform appendage, which is obsolete, if it really exists, in *L. Germanorum*. The second section—which would naturally be taken for a distinct genus if *L. ramulosa* and *L. nana* were unknown, and which still remains well marked—has cylindraceous and few-flowered capitula, the corollas all alike, and regularly five-cleft, and the branches of the style tipped with a long and slender appendage, the very hispid base of which answers to the penicillate tuft of the typical species.

1. LESSINGIA GERMANORUM, Cham. (Tab. 7, A.)

HAB. Herba-Buena, near San Francisco, California.—A very much-branched and diffuse, low herb, soon glabrate; the branches slender. Lower leaves spatulate, pinnatifid; the upper small, linear or oblong, sparingly toothed, more or less granulose-glandular, as are the squarrose, herbaceous tips of the scales of the obconical involucre, which is similar to that of *Corethrogyne*. Heads paniculate, terminating the filiform branchlets, about 25-flowered. Marginal flowers mostly palmate and explanate, forming a kind of ray, yellow, or turning to purple with age, sometimes, I believe, destitute of stamens.

PLATE 7, A. LESSINGIA GERMANORUM: plant, of the natural size. Fig. 1. Flower. 2. Same with corolla laid open. 3. A stamen. 4. Style. 5. Branch of the same more magnified. [The tips incorrectly drawn.] Details more or less enlarged.

## 2. LESSINGIA RAMULOSA, Sp. Nov.

*L. dense lanata, demum subnuda, pumila; ramis e basi brevi validis erectis gracilibus mono-oligocephalis; foliis radicalibus petiolatis lanceolato-spathulatis parce dentatis, caulinis ovatis oblongis vel sublinearibus sessilibus integerrimis, ramealibus minimis ovato-oblongis vel subsagittatis; capitulis pedunculatis; involucro obconico 10-20-floro, squamis apice virentibus vix aut ne vix squarrosis; corollis marginalibus fere regulariter quinquefidis; styli ramis appendice brevi setiformi intra penicillum abscondita cuspidatis.*

*Lessingia ramulosa*, Gray in Benth. Pl. Hartw. p. 314.

HAB. San Rafael, California. Also collected by Hartweg, near Sonora, in the same district.—In the specimens of the Expedition, as well as in those of Hartweg, the summit of the primary stem has perished early, and has been succeeded by lateral branches from the persistent base. The root is that of a biennial or winter-annual. The heads are rather larger than those of the foregoing species; the involucre narrower and scarcely at all squarrose; and the difference between the corollas of the marginal and central flowers, if any, is less marked. The appendage to the branches of the style, which is obsolete or wanting in *L. Germanorum*, is here evident, although hidden in the centre of the penicillate tuft. The near affinity of this species with *L. Germanorum* is evident; and it carries with it the two following species. [Corollas probably white.]

## 3. LESSINGIA NANA, Sp. Nov. (Tab. 7, B.)

*L. pygmæa, undique lanosissima; caulibus ramisque conglobato-confertis; foliis integerrimis, radicalibus spathulatis oblongisve petiolatis, caulinis lanceolatis seu linearibus rigidis cuspidatis sessilibus; capitulis majusculis intra folia caulina arcte sessilibus; involucro 10-15-floro cylindraceo, squamis appressis coriaceo-chartaceis lanceolatis cuspidatis, extimis subherbaceis, intimis albo-hyalinis in acumen gracile spinescens discum subsuperans productis; corollis fere aequalibus regulariter 5-fidis; styli ramis apice breviter penicillatis exappendiculatis.*

*Lessingia nana*, Gray in Benth. Pl. Hartw. p. 315.

HAB. California, at the upper part of the Sacramento River. Also gathered subsequently by the Rev. Mr. Fitch, probably in the same district.—A singular dwarf species, only an inch or two in height, branching from the summit of a slender and evidently annual root; the branches mostly simple, very woolly (as are the leaves), at least when young, and crowded into a conglobate woolly mass, from which the few closely sessile heads, with their bright rufous-purple pappus, barely project their summits. Mr. Fitch's specimen, however, is more developed; the numerous heads, crowded in the axils of the cauline leaves, forming a dense leafy spike, two inches in length. Radical leaves spatulate or oblong, an inch or more in length, including the petiole; the cauline varying from oblong to linear, entire, cuspidate or mucronate, closely sessile, crowded. Heads fully half an inch long, closely sessile, cylindraceous or somewhat obconical; the scales of the involucre rigid, pluriseriate, linear or lanceolate, mucronate or cuspidate, not squarrose, although the elongated inner scales become recurved at maturity. These innermost scales are entirely scarious and white, but of a firm texture, their long, tapering tips somewhat corneous or spinescent, and contrasting strongly with the intensely rufous pappus. Corollas white, in all the flowers regularly five-cleft into long and linear lobes, the marginal ones not more ampliate than the others. Branches of the style as in *L. Germanorum*, but the penicillate tuft shorter: setiform appendage none. The species is an evident congener both of the preceding and of the following.

PLATE 7, B. *LESSINGIA NANA*. Plant, of natural size. Fig. 1. A flower. 2. Genitalia. 3. A detached stamen. 4. Receptacle and part of involucre. Details enlarged.

#### 4. *LESSINGIA VIRGATA*, Sp. Nov.

*L. dense floccoso-lanata, demum denudata; caule erecto ultrapedali; ramis virgatis; foliis caulinis brevibus semi-amplexicaulibus oblongis imisve spathulatis integerrimis, summis concavis appressis subsagittatis; capitulis ad axillas foliorum floralium sessilibus solitariis in spicam elongatam virgatam subconfertis; involucri cylindracei 5-8-flori squamis muticis; corollis regulariter quinquefidis, exterioribus parum ampliatis; styli ramis appendice longo-subulata hispida superatis; pappo corolla multo brevior.*

*Lessingia virgata*, Gray in Benth. Pl. Hartw. p. 315, & in Pacif. Rail Road Rep. 6, p. 76.

HAB. Upper part of the Sacramento River, California; also detected in the same region by Dr. Newberry.—Stems one or two feet high, from an annual or biennial root, virgate and slender, leafy, above once or twice divided into virgate flowering branches, bearing a head in the axil of all the upper leaves, so forming narrow virgate spikes. Radical and lowest cauline leaves spatulate, an inch or more in length, tapering into a short petiole. Cauline leaves shorter and half-clasping; those of the summit and of the flowering branches only three or four lines long, erect, bract-like, concave or cymbæform, rather shorter than the heads. Involucre cylindrical, three lines long, shorter than the disk; the scales pluriserial, linear, obtuse and muticous, appressed, when young woolly outside, at length glabrate. Flowers from 5 to 7 or sometimes 8, all alike, except that the outer ones have a slightly larger, but regularly five-cleft (probably white) corolla, and a more scanty pappus: in all the flowers the pappus barely equals the slender tube of the corolla. The appendage of the styles, which is only rudimentary in *L. ramulosa*, is here prolonged and subulate, and beset with the bristles, which in its congeners form the penicillate tuft, the larger part of them near its base.

## 5. MACHÆRANTHERA, Nees.

### 1. MACHÆRANTHERA CANESCENS, Gray, var. INCANA.

*Diplopappus incanus*, Lindl. Bot. Reg. 1693; Hook. Bot. Mag. t. 3382; DC. Prodr. 5, p. 278.

*Dieteria incana*, Torr. & Gray, Fl. N. Amer. 2, p. 100.

HAB. Oregon; the locality not recorded.—A single specimen, manifestly Lindley's *Diplopappus incanus*, but only a large-flowered, narrow-leaved, and hoary form of *Aster canescens*, Pursh (*Machæranthera canescens*, Gray, Pl., Wright, &c.), of which all Nuttall's species of *Dieteria* are forms, except his *D. coronopifolia*; and that is the original *Machæranthera tanacetifolia*.

6. ASTER, *Tourn.*1. ASTER CONSPICUUS, *Lindl.*

*Aster conspicuus*, Lindl. in Hook. Fl. Bor.-Am. 2, p. 7, & in DC. Prodr. 5, p. 230;  
Torr. & Gray, Fl. 2, p. 107; Hook. Lond. Jour. Bot. 6, p. 240.

HAB. Between Spokane and Fort Colville, and elsewhere in Oregon. Also, a dwarf state, in California, on ridges, said to have been gathered near San Francisco, where this northern species would not have been expected. [This form is evidently *A. radulinus*, Gray, Proc. Am. Acad. 8, p. 388.]

2. ASTER CHAMISSONIS, *Gray.*

*Aster Chilensis*, Nees, Ast. p. 123; DC. Prodr. 5, p. 245; Torr. & Gray, Fl. 2, p. 112.  
*A. spectabilis*? Hook. & Arn. Bot. Beech. Voy. p. 146.  
*A. Durandi*, Durand & Hilgard in Pacif. R. R. Surv. 5, p. 8, sine char., vix Nutt.

HAB. Near San Francisco, California; and on the lower part of the Sacramento.—There is much doubt and confusion about the habitat of the American plants of Hanke's collection. Several described as Peruvian or Chilean prove to be Californian. This *Aster Chilensis*, not found in Chili by any other traveller, is obviously one of the number. [The name of *A. Chamissonis* is applied to this species in the Flora of California, ined., *A. Chilensis* being a false name.]

3. ASTER MENZIESII, *Lindl.* (Tab. 8.)

HAB. Upper Sacramento River, California.—The specimen figured answers well, we believe, to the original collected by Menzies, in California, according to the Banksian herbarium, or on the Northwest Coast, according to that of Hooker. Another form, approaching *A. falcatus*, Lindl. (which is probably of the same species), was collected on the lower part of the Sacramento. The species proves to have no particular relationship to *A. concolor*. Even the pubescence is different, and this is inconstant.

PLATE 8. *ASTER MENZIESII*: a flowering branch. Fig. 1. A ray flower. 2. Its style. 3. Hermaphrodite flower. 4. Separated stamen. 5. Style. The details magnified.

4. *ASTER NOVI-BELGII*, *Linn.*?

HAB. Vicinity of Gray's Harbor, Washington Territory.

5. *ASTER DOUGLASII*, Lindl. l. c.

HAB. California, on the Sacramento River.—The specimens are varieties of an apparently polymorphous species of the Pacific Coast, of which Lindley's *A. Douglasii* may be taken as the type, and to which most of his *A. laxifolius* also belongs. To clear up our Asters requires a special study, and space not here at our disposal. It may here be mentioned that the veritable specimens of *A. Douglasii* lie in the Candolleian herbarium unnamed, and this name is applied in that herbarium to a specimen of *Erigeron corymbosum* or *E. decumbens* of Nuttall, from Douglas's collection.

7. *ERIGERON*, *Linn.*

1. *ERIGERON* (*CÆNOTUS*) *CANADENSE*, *Linn.*

HAB. Nisqually, Washington Territory. A depauperate form, San Francisco, &c., California.

2. *ERIGERON COMPOSITUM*, *Pursh.*

HAB. Kooskooskee, Oregon; and between the Cascade Mountains and the Upper Columbia River.—This species extends not only to the Arctic Sea but also to Greenland. It probably includes *E. trifidum*, Hook., and *E. pedatum*, Nutt.

3. *ERIGERON DIVERGENS*, *Nutt.*

HAB. On the Walla-Walla, Oregon.—It has been confounded with *E. Bellidiastrum*, Nutt., but has a double pappus, &c.

4. ERIGERON PHILADELPHICUM, *Linn.*

HAB. Washington Territory, between Spokane and Fort Colville. Extends through California.

5. ERIGERON SPECIOSUM, *DC.*

HAB. Nisqually, Spipen River, and elsewhere; Oregon and Washington Territory.

6. ERIGERON GLAUCUM, *Ker.*

HAB. San Francisco, California; on the seashore.—This is certainly the *Woodvillæa calendulacea* of De Candolle, founded on specimens from which the violet color of the rays had been discharged.

7. ERIGERON PUMILUM, *Nutt.*

HAB. Between Spipen River and the north fork of the Columbia. Somewhat farther west than before recorded.

8. ERIGERON CONCINNUM, *Torr. & Gray.*

HAB. North fork of the Columbia River. Farther northwest than before known.

9. ERIGERON STRIGOSUM, *Muhl.*

HAB. Nisqually, Washington Territory.—A slender and paniculately branched form of the species.

10. ERIGERON CORYMBOSUM, *Nutt.*

HAB. On the Kooskooskee, &c.: in two forms, one approaching *E. decumbens*, which probably is a form of *E. foliosum*.



11. ERIGERON FILIFOLIUM, *Nutt.*

HAB. Spipen River, Walla-Walla, and north fork of the Columbia.—In dried specimens the rays appear to have been yellow, but they are said to be white, or sometimes tinged with purple or pink.

8. SERICOCARPUS, *Nees.*1. SERICOCARPUS RIGIDUS, *Lindl.*

HAB. Washington Territory, between Satchap River and Gray's Harbor.

9. TOWNSENDIA, *Hook.*1. TOWNSENDIA STRIGOSA, *Nutt.*

HAB. Banks of the Walla-Walla, and of the north branch of the Columbia.

10. GUTIERREZIA, *Lagasca.*1. GUTIERREZIA EUTHAMIÆ, *Torr. & Gray.*

HAB. Bay of San Francisco, California.—In two forms, one answering to *G. Euthamiæ*, the other to *G. Californica*; but the two are probably only forms of one species, although the scattered heads of the latter are larger.

11. SOLIDAGO, *Linn.*1. SOLIDAGO CONFERTIFLORA, *DC.*

HAB. Nisqually, Washington Territory.—A form with the panicle comparatively lax and slender.

2. *SOLIDAGO SPICIFORMIS*, Torr. & Gray.

HAB. Lower part of the Sacramento River, California. It is common down to Monterey.

3. *SOLIDAGO CALIFORNICA*, Nutt.

HAB. California, in the valley of the Sacramento River.

4. *SOLIDAGO ELONGATA*, Nutt.

HAB. San Francisco, California: Oregon, the station not recorded. Also Gray's Harbor, Washington Territory; a doubtful variety, which is the analogue of *S. procera* of the Eastern States.

5. *SOLIDAGO CANADENSIS*, Linn.

HAB. Oregon.—Apparently identical with some of the smoother forms of the eastern *S. Canadensis*.

6. *SOLIDAGO GIGANTEA*, Ait.

HAB. Vicinity of Fort Vancouver; a western form of a mainly eastern species of wide range.

7. *SOLIDAGO (EUTHAMIA) OCCIDENTALIS*, Nutt.

HAB. San Francisco, California, and southern part of Oregon.

12. *LINOSYRIS*, Lobel.1. *LINOSYRIS (CHRYSOTHAMNUS) GRAVEOLENS*, Torr. & Gray.

HAB. Willamette River, &c., Oregon, to the northern part of California.

2. LINOSYRIS (CHRYSTHAMNUS) VISCIDIFLORA, *Hook.*

HAB. Fort Okanagan and elsewhere in the interior of Oregon. [These are now properly distinguished from *Linosyris* of the Old World, and united with *Bigelovia*, which becomes a very considerable genus. This now becomes *Bigelovia Douglasii*, Gray.]

13. APLOPAPPUS, *Cass.*

## 1. APLOPAPPUS (ERICAMERIA) RESINOSUS (Tab. 10).

HAB. California, on the upper waters of the Sacramento. [This proves, upon re-examination, not to be Nuttall's *Ericameria resinosa*, as was thought.] It is really a slender form of the *Aplopappus* (*Ericameria*) *Bloomeri*, Gray in Proc. Am. Acad. 6, p. 541, & 7, p. 354, viz. its var. *angustatus*.

PLATE 10. APLOPAPPUS RESINOSUS, melius A. BLOOMERI var. ANGUSTATUS. Flowering branch. Fig. 1. A ray flower. 2. A disk flower. 3. A detached stamen. 4. Style of disk flower. 5. Receptacle and scales of involucre. The details variously magnified.

2. APLOPAPPUS (ERICAMERIA) ERICOIDES, *Hook. & Arn.*

HAB. California, near San Francisco, where it abounds.—On the whole it appears to be impracticable to retain Nuttall's genus *Ericameria*.

3. APLOPAPPUS (APLODISCUS) MENZIESII, *Torr. & Gray.*

HAB. California, bay of San Francisco. [A connecting form between *Aplopappus* and Torrey & Gray's *Linosyris*, referred to the latter in Plantæ Wrightianæ. It now becomes *Bigelovia* (*Aplodiscus*) *Menziesii*, Gray, Proc. Am. Acad. 8, p. 645.]

## 4. APLOPAPPUS (STENOTUS) STENOPHYLLUS, Sp. Nov.

*A. fruticosus, cæspitoso-ramosus, spithamæus, hirtello-scaber; foliis crebris rigidulis angustissime linearibus (imis subspathulatis) deorsum attenuatis uninerviis; pedunculis ramos terminantibus fere nudis monocephalis; involucro tantum biseriali, squamis lanceolatis acutis subæqualibus dorso glandulosis; ligulis 8-11; pappo albido.*

HAB. Between Spipen River and the north fork of the Columbia, Washington Territory.—A shrubby plant, about a span high, the crowded branches forming tufts, above thickly beset with the rather rigid, lariciform leaves. These are scarcely an inch long, and the widest less than a line wide, rather obscurely one-nerved, minutely glandular-scabrous, tapering from near the apex to the base, not distinctly petioled. Peduncles single, terminating the branches of the season, an inch or less in length, nearly leafless, glandular. Head 4 lines in diameter. Involucre almost simple; the scales lanceolate, acute, glandular-pubescent, and with narrow scarious margins, nearly equalling the disk. Rays 8-11, oblong, yellow. Achemia oblong-obovate, compressed, silky-villous, about the length of the soft, white pappus.

## 5. APLOPAPPUS (STENOTUS) LANUGINOSUS, Sp. Nov.

*A. floccoso-lanuginosus; caulibus simplicibus herbaceis e caudice lignescente inferne foliosis apice nudis monocephalis; foliis mollibus lineari-spathulatis in petiolum attenuatis, summis fere filiformibus; involucri laxi squamis oblongo-lanceolatis acuminatis subæqualibus margine scariosis; ligules 15-20; pappo albo.*

HAB. Upper part of the north fork of the Columbia River, in open places.—Plant apparently forming tufts from a somewhat ligneous caudex; the stems a span or more in height, herbaceous, erect, simple, moderately leafy below, the whole plant floccose-woolly. Lower and radical leaves 2 or 3 inches long, including the slender petiole, 2 or 3 lines wide towards the apex, soft, not at all rigid, entire, mostly obtuse, obscurely 3-nerved by transmitted light; the uppermost reduced to almost filiform bracts. Heads as large as those of *A. (Stenotus) lineari-*

*folius*; the involucre, &c., similar, except that it is loosely woolly; the pappus, achemia, &c., very similar.—This connects *A. (Stenotus) linearifolius*, DC., with species of the section *Inulopsis*, DC. (*Arnicella*, Torr. & Gray), so weakening the claim of *Stenotus*, Nutt., to a generic standing.

#### 14. AMMODIA, Nutt.

##### 1. AMMODIA OREGANA, Nutt.

HAB. Banks of the Kooskooskee, Walla-Walla, and Willamette, Oregon. [Now referred to *Chrysopsis*.]

#### 15. GRINDELIA, Willd.

##### 1. GRINDELIA HIRSUTULA, Hook. & Arn.

HAB. San Francisco, California; Nisqually and Gray's Harbor, Puget Sound: forms approaching *G. integrifolia*, DC., which is apparently reducible to a variety of this species. Fraser's River, Dr. Holmes: a rather dwarf state, not well distinguishable from the Californian plant.

##### 2. GRINDELIA ROBUSTA, Nutt.

HAB. California, in the vicinity of San Francisco: forms approaching *G. squarrosa* in aspect.

##### 3. GRINDELIA NANA, Nutt.

HAB. Oregon and Washington Territory, on the Walla-Walla, &c. This is the *G. humilis* of Torrey & Gray's Flora, excluding the rayless variety, but the original of that species, from California, appears to be something different.

##### 4. GRINDELIA CUNEIFOLIA, Nutt.

HAB. California, on and near the coast, and the lower Sacramento.

16. CHRYSOPSIS, *Nutt.*1. CHRYSOPSIS VILLOSA, *Nutt.*

HAB. On the Kooskooskee, Willamette, &c.; in various forms.

2. CHRYSOPSIS SESSILIFLORA, *Nutt.*

HAB. California, on the lower Sacramento, near San Francisco, &c.: with the var. *echioides* (*C. echioides*, Benth.), or a form near it.

17. BACCHARIS, *Linn.*1. BACCHARIS CONSANGUINEA, *DC.*

HAB. Bay of San Francisco, and lower part of the Sacramento River, California.—*B. pilularis*, DC., is a form of the same species, and should, perhaps, give the name to be adopted.

2. BACCHARIS DOUGLASII, *DC.*

HAB. California; with the preceding.—The receptacle is conical.

18. PLUCHEA, *Cass.*1. PLUCHEA CAMPHORATA, *DC., Torr. & Gray.*

HAB. Bay of San Francisco, California.—A single specimen, apparently of the species of the Atlantic Coast. As it has not been received from any other collector, we suspect the seeds may have been carried in ballast from New York or Boston. [Again and recently collected by Dr. Bolander. As it occurs in Southern Nevada and Arizona it is probably indigenous.]

19. I V A, *Linn.*1. I V A AXILLARIS, *Pursh.*

Var. PUBESCENS: *pube villosa cinerea; involucris cyathiformis squamis usque ad apicem plerumque connatis.*

*Iva foliosa*, Nutt. in Trans. Am. Phil. Soc. n. ser. 7, p. 346, forma pilosior.

HAB. Bay of San Francisco, California.—A remarkable variety, quite villous, with lax or spreading hairs; also a specimen of the normal type. Between the Spokane and the Okanagan Rivers, Oregon; merely cinereous-pubescent; the involucral scales sometimes connate to the summit, as in the variety, sometimes distinct half way down.

20. A M B R O S I A, *Tourn.*1. A M B R O S I A PSILOSTACHYA, *DC.*

*Ambrosia psilostachya*, DC. Prodr. 5. p. 526; Gray, Pl. Wright, 1, p. 104, & 2, p. 86.

*A. Lindheimeriana* & *A. glandulosa*, Scheele in Linnæa, 22, p. 156.

*A. coronopifolia*, Torr. & Gray, Fl. 2, p. 291.

HAB. Bay of San Francisco, and on the Sacramento, California. Also collected in California by Coulter.

21. F R A N S E R I A, *Cav.*1. F R A N S E R I A CHAMISSONIS, *Less.*

HAB. Gray's Harbor, Washington Territory, and Bay of San Francisco, California; the var. *cuneifolia*, Torr. & Gray, or *F. cuneifolia*, Nutt. We have not yet seen any specimens with roundish-elliptical leaves.

2. *FRANSERIA BIPINNATIFIDA*, *Nutt.*

HAB. Nisqually, Oregon; San Francisco, California.—With smaller, more finely cut, and more canescently hairy leaves than the Oregon plant, but identical with Douglas's California specimens; apparently also with Nuttall's *F. pumila*.

3. *FRANSERIA HOOKERIANA*, *Nutt.*

HAB. On the Walla-Walla, Washington Territory, &c.—Not yet flowering.

22. *XANTHIUM*, *Tourn.*1. *XANTHIUM STRUMARIUM*, *Linn.*

Var. *CANADENSE*, Torr. & Gray, and var. *ECHINATUM*, Gray.

HAB. On the Sacramento, California, both the above-mentioned varieties; and on the Walla-Walla, Washington Territory, the var. *echinatum* (*X. echinatum*, Murray, &c.), just like the plant of the Atlantic Coast.

23. *WYETHIA*, *Nutt.*1. *WYETHIA ANGUSTIFOLIA*, *Nutt.*

HAB. California, near San Francisco, and on the Sacramento; in fruit only.

2. *WYETHIA AMPLEXICAULIS*, *Nutt. l. c.*

HAB. Washington Territory east of the Cascade Mountains.



24. BALSAMORHIZA, *Hook., Nutt.*1. BALSAMORHIZA HOOKERI, *Nutt.*

*Balsamorhiza Hookeri, terebinthacea, & hirsuta*, Nutt. in Trans. Am. Phil. Soc. n. ser. 7, p. 349; Torr. & Gray, Fl. l. c.

*Heliopsis?* *Balsamorhiza & terebinthacea*, Hook, Fl. Bor.-Am. 1, p. 310.

HAB. Between Spipen River and the north branch of the Columbia; the form named *B. Hookeri* by Nuttall, more silky-hairy than his *B. hirsuta*, which is just Hooker's *Heliopsis?* *Balsamorhiza*. Also, gathered in the same district, the variety with the leaves barely serrate towards the apex, and pectinately or laciniately toothed towards the base, the *H.?* *terebinthacea*, Hook, l. c.

2. BALSAMORHIZA SAGITTATA, *Nutt.*

*Balsamorhiza sagittata & B. helianthoides*, Nutt. in Trans. Amer. Phil. Soc. l. c.

*Espeletia sagittata & E. helianthoides*, Nutt. in Jour. Acad. Philad. 7, p. 38, t. 4; Gray, Pl. Fendl. p. 82.

HAB. Interior of Oregon; the station not given.

3. BALSAMORHIZA DELTOIDEA, *Nutt.* (Tab. 11.)

HAB. Nisqually and Port Discovery, Washington Territory.—*B. glabrescens*, Benth. Pl. Hartw., p. 317 (no. 1785), is apparently a form of the same species with very entire leaves.

PLATE 11. BALSAMORHIZA DELTOIDEA. Fig. 1. A ray flower. 2. A disk flower. 3. A detached stamen. 4. Style of a disk flower. The details magnified.

4. BALSAMORHIZA CAREYANA, *Gray*.

*Balsamorhiza Careyana*, Gray, Pl. Fendl. p. 81, adn. Mr. Spalding.

HAB. Interior of Oregon or of Washington Territory, on the Walla-Walla.—Specimens in flower, and with thin cinereous leaves; and others in fruit, with adult, chartaceous, reticulated, and scabrous leaves. Remarkable for the persistent and papery rays; but really of this genus.

25. RUDBECKIA, *Linn.*1. RUDBECKIA OCCIDENTALIS, *Nutt, l. c.*

Var. SCABRA : *foliis plerisque dentatis utrinque hirtello-scabris.*

HAB. Interior of Washington Territory, on the Kooskooskee River; the form with nearly smooth and entire leaves; the upper ones sessile by a broad base. Oregon, between Willamette and California; the rough-leaved variety, otherwise resembling Nuttall's specimens, most of the leaves sparingly toothed, all of them contracted at the base into a marginal petiole.

26. HELIANTHUS, *Linn.*1. HELIANTHUS PETIOLARIS, *Nutt.*

HAB. Fort Okanagan and Rogue River, Washington Territory; and in California on the lower part of the Sacramento.

2. HELIANTHUS CALIFORNICUS, *DC.*

HAB. On the lower part of the Sacramento, California.

27. *HELIANTHELLA*, Torr. & Gray.1. *HELIANTHELLA LANCEOLATA*, Torr. & Gray.

HAB. Interior of Oregon or Washington Territory, at Fort Okanagan and on the Kooskooskee, where it was also collected by the Rev. Mr. Spalding.

28. *COREOPSIS*, Linn.1. *COREOPSIS ATKINSONIANA*, Dougl.

HAB. Oregon; the station not given.—Root evidently biennial.

29. *BIDENS*, Tourn.1. *BIDENS CERUNA*, Linn., var. *ELATA*, Torr. & Gray.2. *BIDENS FRONDOSA*, Linn.3. *BIDENS BIPINNATA*, Linn.?

HAB. California; the latter at San Francisco (specimen too poor for determination); the others on the lower part of the Sacramento: western representatives of common eastern species.

30. *GAILLARDIA*, Foug.1. *GAILLARDIA ARISTATA*, Pursh.

HAB. Oregon; widely diffused and common; the western representative of this mainly Atlantic North American genus.

## 31. CHÆNACTIS, DC.

## 1. CHÆNACTIS DOUGLASII, Hook. &amp; Arn.

*Chænactis Douglasii*, & *C. achilleæfolia*, Hook. & Arn. Bot. Beech. Voy. p. 354;  
Torr. & Gray, Fl. 2, p. 371.

*Hymenopappus Douglasii*, Hook. Fl. Bor.-Am. 1, p. 316.

*Macrocarphus Douglasii* & *M. achilleæfolius*, Nutt. in Trans. Amer. Phil. Soc. l. c.

HAB. Oregon; common in prairies. The two so-called species are clearly only one.

## 32. HYMENOPAPPUS, L'Her.

## 1. HYMENOPAPPUS FILIFOLIUS, Hook.

HAB. Oregon, on the Walla-Walla River: a species of the great plains eastward.

## 33. BAHIA, Lag.

## 1. BAHIA (ERIOPHYLLUM) ARACHNOIDEA, Fisch. &amp; Lallemand.

*Bahia arachnoidea*, Fisch. & Lallemand. Ind. Sem. 1842; Gray, Pl. Fendl. p. 100,  
adn., & in Pacif. R. R. Surv. 4, p. 105.

*B. latifolia*, Benth. Bot. Voy. Sulph. p. 30.

HAB. San Francisco, California, where it abounds.

## 2. BAHIA (ERIOPHYLLUM) LANATA, Nutt.

HAB. Puget Sound, Gray's Harbor, Nisqually, &c.; mostly the slender form, *B. tenuifolia*, DC.

3. *BAHIA (ERIOPHYLLUM) LEUCOPHYLLA, DC.*

HAB. Spokane, Kooskooskee, Fort Okanagan, and elsewhere in the interior of Oregon.

4. *BAHIA (ERIOPHYLLUM) CONFERTIFLORA, DC.*

HAB. California, on the shores of the Bay of San Francisco and elsewhere.

5. *BAHIA (ERIOPHYLLUM) ARTEMISIFOLIA, Less.*

HAB. Bay of San Francisco; common on the coast.

34. *BAERIA, Fisher & Meyer.*1. *BAERIA ULIGINOSA, var. TENELLA.*

*Dichæta tenella*, Nutt. in Trans. Amer. Phil. Soc. n. ser. 7, p. 383; Torr. & Gray, Fl. 2, p. 380.

HAB. California, in the vicinity of San Francisco.—Only a depauperate form of Nuttall's *Dichæta uliginosa*; which genus we had reduced to *Burrielia* [but, following Bentham, now refer to *Baeria*].

35. *ACTINELLA, Pers.*1. *ACTINELLA RICHARDSONII, Nutt, l. c.*

HAB. Between the Willamette and California.—Well figured by Hooker under the name of *Picradenia Richardsonii*.

36. HELENIUM, *Linn.*1. HELENIUM AUTUMNALE, *Linn.*

HAB. Between the Willamette and California; the var. *grandiflorum*, *H. grandiflorum* of Nuttall; differing from the eastern plant in its greater size.

2. HELENIUM PUBERULUM, *DC.*

HAB. On the Rio Sacramento, California, &c.: common near the coast.

37. BLEPHARIPAPPUS, *Hook.*1. BLEPHARIPAPPUS SCABER, *Hook.*

HAB. Interior of Oregon; on the Kooskooskee River, &c.: common.

38. LAYIA, *Hook. & Arn.*1. LAYIA (MADAROGLOSSA) GLANDULOSA, *Hook. & Arn.*

HAB. Oregon, on the Walla-Walla River, and elsewhere.

39. HEMIZONIA, *DC.*1. HEMIZONIA LUZULÆFOLIA, *DC.*

HAB. California, near San Francisco, where it abounds.—Flowers white, opening only in bright sunshine.

2. HEMIZONIA RUDIS, *Benth.*

*Hemizonia rudis*, Benth. Bot. Voy. Sulph. p. 31.

HAB. On the lower part of the Sacramento, California. Also gath-

ered by Fremont, Dr. Bloomer, &c. A species closely allied to the next; but more glandular-viscid, generally very much so, and with smaller heads, fewer and broader involucreal scales, &c.

### 3. *HEMIZONIA ANGUSTIFOLIA*, DC.

*Hemizonia angustifolia*, DC. Prodr. 5, p. 692; Torr. & Gray, Fl. 2, p. 398, excl. syn.

*H. multicaulis*, Hook. & Arn. Bot. Beech. Voy. p. 355.

*H. decumbens*, Nutt. Pl. Gamb. p. 175.

HAB. Near San Francisco, California; common all along the coast regions.

### 4. *HEMIZONIA PUNGENS*, Torr. & Gray, l. c.

HAB. California, on the lower part of the Rio Sacramento: common on dry hills.

### 5. *HEMIZONIA FITCHII*, Gray.

*Hemizonia Fitchii*, Gray in Bot. Mex. Bound. Surv. p. 109.

HAB. Valley of the Sacramento, near Sutter's, California; in dry places.—This is a more advanced, polycephalous, and rigid state of the species than that which was described in the Botany of the Mexican Boundary Survey. The pinnatifid lower cauline leaves have mostly disappeared; all the rest are entire, linear-acerose, rigid and pungent. The heads, &c., accord well with the published description, but the mature achenia show scarcely any stipe.

## 40. *CALYCADENIA*, DC.

### 1. *CALYCADENIA VILLOSA*, DC.

HAB. California; valley of the Sacramento below Sutter's.—The genus is too close to *Hemizonia*.

2. CALYCADENIA TRUNCATA, *DC.*

HAB. California, along the upper part of the Sacramento River.

41. LAGOPHYLLA, *Nutt.*1. LAGOPHYLLA RAMOSISSIMA, *Nutt.*

HAB. Washington Territory, between Spokane and Fort Colville; also between the Willamette and California.

42. ANISOCARPUS, *Nutt.*1. ANISOCARPUS MADIOIDES, *Nutt.*

HAB. Nisqually, and elsewhere in woody places, Oregon. [This and the four following genera are now appropriately reduced to *Madia* by Bentham and Hooker.]

43. MADARIA, *DC.*1. MADARIA ELEGANS, *DC.*

HAB. California, at San Francisco, and on the Sacramento.—A polymorphous species, which evidently includes *M. corymbosa*, Endlicher, Iconogr. t. 36, and *M. racemosa* of Nuttall.

44. MADIA, *Molina.*1. MADIA SATIVA, *Molina.*

HAB. San Francisco, California; appearing as if indigenous to the Northern Continent; but perhaps only of Chilian origin.



2. *MADIA DISSITIFLORA*, Torr. & Gray, *l. c.*

HAB. Interior of Oregon; the station not recorded; but it is not uncommon throughout the region.

45. *AMIDA*, Nutt.1. *AMIDA HIRSUTA*, Nutt. *l. c.*

HAB. Between the Willamette River and California; not rare on the interior plains.

46. *HARPÆCARPUS*, Nutt.1. *HARPÆCARPUS MADARIOIDES*, Nutt. *l. c.*

HAB. Oregon; the station not recorded; rather common both in Oregon and California.

47. *JAUMEA*, Pers.1. *JAUMEA CARNOSA*.

*Coinogyne carnosa*, Less. in Linnæa, 6, p. 520; DC. Prodr. 6, p. 41.

HAB. In salt marshes, Gray's Harbor, Puget Sound; and Bay of San Francisco, California.—This belongs to the *Heleniæ*, notwithstanding the absence of pappus, and must be regarded as the epappose state of the genus *Jaumea*, of the southeastern coast of America. [A view now already taken by Bentham and Hooker, but without referring to the absence of pappus in this northern species.]

48. ACHILLEA, *Linn.*1. ACHILLEA MILLEFOLIUM, *Linn.*

HAB. Abundant in Washington Territory, Oregon, and California, apparently even more so than in Eastern North America, where it is rarely met with in situations which show it to be unequivocally indigenous.

49. MATRICARIA, *Linn.*1. MATRICARIA (ANACTIDEA) DISCOIDEA, *DC.*

HAB. Interior of Washington Territory, between Spokane and Fort Colville. Also (winter vestiges) Bay of San Francisco, California.—This is common from California to Unalashka, and occurs also on the northeastern coast of Siberia. It has (probably recently) found its way to the vicinity of St. Louis, Missouri, where, according to Dr. Engelmann, it is a weed on both sides of the Mississippi. It equally occurs in Sweden, where, according to Fries, it has for many years abounded in the vicinity of Upsal, growing with *Maruta Cotula*. It will be well to notice if it continues to extend its range.

50. TANACETUM, *Linn.*1. TANACETUM HURONENSE, *Nutt.*

HAB. Coast of Washington Territory, at Gray's Harbor, &c., and of California at San Francisco.—This has extended eastward to the upper Great Lakes and Hudson's Bay.

51. ARTEMISIA, *Linn.*1. ARTEMISIA DRACUNCULOIDES, *Pursh, Torr. & Gray.*

HAB. California, on the Sacramento and near San Francisco. Farther west than before known. This, with *A. glauca*, should perhaps be joined to *A. dracunculus*.

2. ARTEMISIA CANADENSIS, *Michx., Torr. & Gray.*

HAB. Okanagan and Nisqually, Washington Territory; the silky-leaved form.

3. ARTEMISIA CANA, *Pursh?*

HAB. Between Spigen River and the north fork of the Columbia River, Washington Territory.—With only vestiges of flowers, and therefore of uncertain determination.

4. ARTEMISIA TRIDENTATA, *Nutt.*

HAB. On the Walla-Walla, &c., Oregon. The principal “sagebush” of the interior plains.

5. ARTEMISIA TRIFIDA, *Nutt.*

HAB. On the north fork of the Columbia River, the plains east of the Cascade Mountains, &c.

6. ARTEMISIA LUDOVICIANA, *Nutt.*

HAB. Washington Territory, between Spokane and Colville; a variety with laciniated leaves. California, on the Sacramento and near San Francisco; the varieties *latiloba* and *gnaphalodes*. Walla-Walla River, &c., Oregon; a variety of this polymorphous species with pinnatifid leaves and narrow segments, probably *A. Hookeriana*, Besser.

7. ARTEMISIA TILESII, *Ledeb.*

HAB. Point Discovery, &c., Washington Territory. Probably only a form of *A. vulgaris*.

8. ARTEMISIA PYCNOCEPHALA, *DC.*

HAB. California; common in the vicinity of San Francisco, where it was collected by Chamisso.

9. ARTEMISIA BIENNIS, *Willd.*

HAB. San Francisco, California.—Specimens depauperate and too young, but apparently of this species, not before detected on the Pacific Coast. It occurs in the Himalayas.

10. ARTEMISIA CALIFORNICA, *Less.*

*Artemisia Californica*, Less. in Linnæa, 6, p. 523; Hook. & Arn. Bot. Beech. p. 150; Bess. in Linnæa, 15, pp. 93, 109; Torr. & Gray, l. c., p. 424.  
*A. Fischeriana*, Bess. in DC. Prodr. 6, p. 105; Torr. & Gray, l. c.  
*A. abrotanoides* & *A. foliosa*, Nutt. in Trans. Amer. Phil. Soc. n. ser. 7, p. 397.

HAB. San Francisco and on the lower part of the Sacramento, California.

52. GNAPHALIUM, *Linn.*1. GNAPHALIUM RAMOSISSIMUM, *Nutt.*

*Gnaphalium ramosissimum*, Nutt. Pl. Gamb. in Jour. Acad. Philad., n. ser. 1, p. 173.  
*G. Sprengelii*? var. *erubescens*, Nutt. in Trans. Amer. Phil. Soc. n. ser. 7, p. 403.  
*G. Californicum*, var.? Torr. & Gray, Fl. 2, p. 426.

HAB. San Francisco, California (where it was also gathered by Mr. Barclay); with slightly rose-tinted involucre; and on the Sacramento,

without the rose-tint.—Apparently a pretty well-marked species, with smaller heads than those of *G. Californicum*, paniced on numerous slender branches, the scales of the somewhat turbinate involucre yellowish-white or sordid, sometimes tinged with rose-color, not silvery-white, narrower, and mostly somewhat pointed. Herbage glandular and odorous.—Whether *G. Californicum* is specifically distinct from *G. decurrens* is still uncertain, but we have the latter from Fraser River, Northwest America, collected by Mr. Wallace.

2. GNAPHALIUM SPRENGELII, *Hook. & Arn.*

HAB. Bay of San Francisco, California.—A great part of the specimens which we have from time to time referred to this species perhaps belong to the following; but this can hardly be the case with the present specimens, which resemble those of Hartweg's No. 1811, except that the involucre is whiter.

3. GNAPHALIUM LUTEO-ALBUM, *Linn.*

HAB. Gray's Harbor, Puget Sound, and in California, common.—To this belongs the greater part of what has been called *G. Sprengelii*. Still the American plants do not well accord with the European *G. luteo-allum*.

4. GNAPHALIUM PALUSTRE, *Nutt.*

HAB. Interior of Washington Territory and Oregon, and, in California, on the Sacramento, &c.

5. GNAPHALIUM (GAMOCHÆTA) PURPUREUM, *Linn.*

HAB. San Francisco, California.—This species (for which the Linnean name claims to be retained), as Dr. Hooker (*Fl. Antarc.* 2, p. 309) and Weddell (*Chloris Andina*, 1, p. 229) agree, embraces all the American species of the group, which Weddell has on plausible grounds raised to the rank of a genus. Nuttall's *G. ustulatum* must be one of the many forms of the species.

53. ANTENNARIA, *Gærtn.*1. ANTENNARIA (MARGARIPES) MARGARITACEA, *R. Br.*

HAB. Puget Sound, and in California near San Francisco.—Upon grounds which appear to be tenable, Weddell separates this from *Antennaria* proper, and refers it to *Helichrysum*; but the systematic value of the union of the bristles of the pappus in this subtribe requires to be further tested. [Bentham and Hooker, in Gen. Pl. 2, p. 303, refer the plant to *Anaphalis*, *A. margaritacea*.]

2. ANTENNARIA RACEMOSA, *Hook.*

HAB. Mountains and interior plains of Washington Territory.—The western analogue of *A. plantaginifolia* (which, however, itself occurs in the region) as to foliage; but the loose racemose or panicle is peculiar; also the slightly 2-cleft style.

3. ANTENNARIA DIOICA, *Gærtn.*

HAB. Nisqually, and between Colville and Spokane, and elsewhere in Washington Territory. There is also, from the same interior region of the Upper Columbia, a state with remarkably tall and leafy stems, probably of this species, but too young for determination.

4. ANTENNARIA CARPATHICA, *R. Br.*

HAB. Interior of Washington Territory; the male of the tall var. *pulcherrima*, Hook., with remarkably white involucre scales.

5. ANTENNARIA LUZULOIDES, *Torr. & Gray.*

HAB. Interior of Washington Territory, between Spokane, Colville and the Kooskooskee.—Both sexes were collected. The inner involucre scales of the female are smaller, narrower, and more scarious

than those of the male, but obtuse or obtusish. Bentham's *A. argentea* (also collected in California by Dr. Bigelow) is a variety with somewhat larger heads and broader leaves, especially the lowest, verging towards the ambiguous var. *pulcherrima*, Hook., of *A. Carpathica*, which appears to have the bristles of the male pappus more strongly clavate than in the European *A. Carpathica*. In *A. luzuloides* the enlargement is still greater.

#### 6. ANTENNARIA ALPINA, *Gœrtn.*

Var.? *stenophylla*: *caulibus floridis spithamæis foliossimis; foliis angustissime elongato-linearibus cano-lanuginosis.*

HAB. Between Spipen River and the north fork of the Columbia.—This is to the ordinary *A. alpina* nearly what *A. luzuloides* is to the European *A. Carpathica*. The fuscous involucre is that of *A. alpina*; the male pappus, as in that species, moderately thickened upwards; but the stems and leaves are very white with appressed wool; the former leafy to the top; the leaves all remarkably long and narrow, even the lowest less than a line wide and fully three inches long.

#### 7. ANTENNARIA DIMORPHA, *Torr. & Gray.*

*Antennaria dimorpha*, Torr. & Gray, Fl. 2, p. 431.

*Gnaphalium* (*Omalotheca*, *Heterophania*) *dimorphum*, Nutt. in Trans. Amer. Phil. Soc. n. ser. 7, p. 405.

Var. FLAGELLARIS: *caudice simplici inter folia stolones filiformes primum erectos emittente.*

HAB. Between Spipen River and the north fork of the Columbia, Washington Territory; the male plant of the ordinary form, and (scantly) the female of the var. *flagellaris*.—Nuttall describes the *A. dimorpha* as stoloniferous; but we have seen only creeping rootstocks, except in the remarkable specimens here characterized. Except for those slender and naked runners, about three inches long, the plants appear to be only *A. dimorpha*, less tufted than usual, perhaps younger, and laxer. The female pappus is deciduous in a ring, as in *Antennaria*. At first sight this variety seems to be wholly distinct, but probably is not so.

54. SENECIO, *Linn*1. SENECIO AUREUS, *Linn*.

HAB. Interior of Washington Territory, at various stations; the typical form, and a state of the var. *Balsamitæ* (*S. Plattensis*, Nutt.) from Okanagan; also the var. *borealis*, from the eastern side of the Cascade Mountains.

2. SENECIO CANUS, *Hook*.

HAB. Interior of Washington Territory; forms approaching states of the last, much as do forms of the analogous *S. tomentosus* along the Alleghanies.

3. SENECIO FASTIGIATUS, *Nutt*.

HAB. Between Spipen River and the north fork of the Columbia.—Certainly identical with Nuttall's plant, but probably an entire-leaved form of *S. canus*.

4. SENECIO EXALTATUS, *Nutt*.

HAB. Between Okanagan and Grand Coulee, Washington Territory.—Probably a mere variety of *S. lugens*, which occurs in the Rocky Mountains a little further north.

5. SENECIO HYDROPHILUS, *Nutt*.

HAB. Interior of Oregon; and on the Sacramento River, California.



6. *SENECIO ANDINUS*, *Nutt.*

HAB. Washington Territory, between the Spokane and Fort Colville; also between the Kooskooskee and the Walla-Walla.—Accords with Nuttall's own specimens; but the leaves are mostly denticulate, and none of them cordate or even abrupt at the base.

55. *TETRADYMIA*, *DC.*1. *TETRADYMIA CANESCENS*, *DC.*

HAB. North fork of the Columbia, Washington Territory; same as the Douglasian plant, which was also collected by Mr. Spalding on the Kooskooskee. Between the Willamette and California, with rather shorter leaves; clearly uniting *T. inermis* of Nuttall with the original species.

56. *CROCIDIUM*, *Hook.*1. *CROCIDIUM MULTICAULE*, *Hook.*

HAB. Oregon; the station not recorded; doubtless towards the coast.

57. *ARNICA*, *Linn.*1. *ARNICA MOLLIS*, *Hook.*

HAB. Oregon or Washington Territory; the station not given.

2. *ARNICA LATIFOLIA*, *Bong.*3. *ARNICA CORDIFOLIA*, *Hook.*

HAB. Washington Territory; the station not recorded, but both species are common in all the woody region.

4. ARNICA ALPINA, *Vahl.*, var.

HAB. North fork of the Columbia River.—A tall variety, one of those which approach the narrower-leaved forms of *A. Chamissonis*.

58. CENTAUREA, *Linn.*1. CENTAUREA MELITENSIS, *Linn.*

HAB. San Rafael, California. Doubtless adventive from Europe.

59. CIRSIUM, *Tourn.*1. CIRSIUM FOLIOSUM, *DC.*?

HAB. Between the Spokane and Fort Colville, Washington Territory (specimen imperfect): Kooskooskee to Walla-Walla.

2. CIRSIUM REMOTIFOLIUM, *DC.*

HAB. Nisqually, and Gray's Harbor, Washington Territory.

3. CIRSIUM UNDULATUM, *Spreng.*

HAB. Oregon, and Northern California.—A variable and confused species, of unsettled limits; the forms with smaller and more globular heads include *C. canescens* and *C. Hookerianum* of Nuttall.

4. CIRSIUM ALTISSIMUM, *Spreng.*?

HAB. Washington Territory, between the Cascade Mountains and the Columbia River.

## 60. CALAIS, DC.

CALAIS, DC. Prodr. 7, p. 85, char. anct. Gray in Pacif. R.R. Surv. 4, p. 112, adn.  
SCORZONELLA & UROPAPPUS, Nutt. in Trans. Amer. Phil. Soc. n. ser. 7, pp. 424,  
426; Torr. & Gray, Fl. 2, p. 470.  
PTILOPHORA, Gray, Pl. Fendl. p. 113.

## 1. CALAIS (CALOCALAIS) MACROCHÆTA, Gray.

*Calais macrochæta*, Gray, Pl. Fendl. l. c. & in Pacif. R.R. Surv. 4, p. 112, excl. syn.

HAB. Oregon, on the Kooskooskee or Clearwater River. Rev. Mr. Spalding.

## 2. CALAIS (SCORZONELLA) LACINIATA, Gray, l. c.

*Hymenonema?* *laciniatum* & *H.?* *glaucum*, Hook. Fl. Bor.-Am. 1, p. 301.  
*Scorzonella laciniata*, *leptosepala*, & *glauca*, Nutt. in Trans. Amer. Phil. Soc. l. c.

HAB. Interior of Oregon.—Some elongated specimens with entire leaves; probably the *Hymenonema?* *glaucum* of Hooker.

## 3. CALAIS (PTILOPHORA) MAJOR, Gray, l. c.

*Ptilophora major*, Gray, Pl. Fendl. p. 113.

HAB. On the Kooskooskee or Clearwater River. Collected by Mr. Spalding.

## 4. CALAIS (PTILOPHORA) NUTANS, Gray, l. c.

*Crepis nutans*, Geyer, ined. in Herb., Hook.  
*Scorzonella nutans*, Hook. in Lond. Jour. Bot. 6, p. 253.

HAB. North fork of the Columbia, Spokane, &c., interior of Washington Territory; also collected with the preceding by Mr. Spalding.

61. STEPHANOMERIA, *Nutt.*1. STEPHANOMERIA MINOR, *Nutt.*

*Stephanomeria minor, runcinata & heterophylla*, Nutt. in Trans. Amer. Phil. Soc. n. ser. 7, p. 427.

*Lygodesmia minor*, Hook. Fl. Bor.-Am. 1, p. 205, t. 103.

*Prenanthes? tenuifolia & P. runcinata*, Torr. in Ann. Lyc. N. Y. 2, p. 210.

*Jamesia pauciflora*, Nees in Neuwied, Trav. appx.

HAB. Interior of Washington Territory and Oregon, Okanagan, Walla-Walla, &c.

2. STEPHANOMERIA PANICULATA, *Nutt. l. c.*

HAB. On the Walla-Walla, and thence to the Sacramento, California.—This is as variable as the preceding species in the size and disposition of the heads; but is erect and virgately paniculate, often tall; the heads sometimes loosely panicked, sometimes almost sessile along the long branches, making a virgate spike. It appears to include both *S. elata*, Nutt. in Jour. Acad. Philad. (Pl. Gamb.,) and *S. virgata*, Benth. Bot. Voy. Sulph.

62. HIERACIUM, *Tourn.*1. HIERACIUM ALBIFLORUM, *Hook.*

HAB. Washington Territory, at Gray's Harbor, Nisqually, &c., and east of the Cascade Mountains.

2. HIERACIUM SCOULERI, *Hook.*

HAB. Interior of Washington Territory, Fort Colville and Okanagan, very shaggy varieties, imitating *H. longipilum*; and on the Walla-Walla, &c.

63. CREPIS, *Linn.*1. CREPIS OCCIDENTALIS, *Nutt.*

HAB. Interior of Washington Territory, between Spigen River and the north fork of the Columbia River, &c.; also on the Kooskooskee.

2. CREPIS ACUMINATA, *Nutt.*

HAB. With the preceding; also, from the interior of Washington Territory, a very slender variety with the leaves and their divisions narrowly linear.

64. TROXIMON, *Nutt.*1. TROXIMON CUSPIDATUM, *Pursh.*

HAB. On the north fork of the Columbia River. Specimen incomplete, but apparently of this species.

2. TROXIMON GLAUCUM, *Nutt.*

Var. DASYCEPHALUM, Torr. & Gray: *foliis sæpius amplis dilatatis obovato-spathulatis quandoque parce dentatis.*

*T. taraxiceifolium*, Nutt. in Trans. Amer. Phil. Soc. n. ser. 7, p. 434.

HAB. Washington Territory, Fort Vancouver; with lanceolate leaves, and the involucre either hairy or nearly glabrous. Kooskooskee River; with large, obovate-spatulate, and mostly entire leaves; the *T. taraxiceifolium* of Nuttall; a remarkable form, but apparently inseparable from *T. glaucum*, already noticed in Pl. Fendl. p. 115.

## 65. MACRORHYNCHUS, Less.

## 1. MACRORHYNCHUS TROXIMOIDES, Torr. &amp; Gray.

*Macrorhynchus troximoides*, Torr. & Gray, Fl. 2, p. 491.

*Troximon aurantiacum*, Hook. Fl. Bor.-Am. 1, p. 300, t. 104.

HAB. On the Cascade Mountains, Washington Territory; a species of wide range and considerable diversity.

## 2. MACRORHYNCHUS RETRORSUS, Benth. Pl. Hartw.

HAB. Interior of Oregon; probably gathered on the journey from Willamette to California. Accords with Hartweg's and with Dr. J. M. Bigelow's specimens. Beak of the achenium at length becoming an inch long, springing abruptly from the truncate apex of the achenium.

## 3. MACRORHYNCHUS LESSINGII, Hook. &amp; Arn.

HAB. Puget Sound, at Gray's Harbor, and Nisqually, Washington Territory. Between the Willamette, Oregon, and California; and near San Francisco. Various forms.—Unless the *M. grandiflorus* proves permanently distinct by the short and broad, rather foliaceous and denticulate exterior series of involucre scales (which are probably abnormal), it seems likely that *M. Lessingii* must include all the perennial *Macrorhynchi* of our Pacific Coast, excepting the two preceding species. That the foliage varies greatly is nothing extraordinary. The size of the head appears to vary from that of the largest dandelion to that of the smallest *Leontodon autumnale*, with a monocephalous state of which Lessing compares his plant; while the specimen described by Hooker and Arnott, in Beechey's Voyage, is of the larger-flowered sort. The achenium, moreover, is sometimes obtusely, but strongly, ten-ribbed, sometimes acutely and alately ribbed; but it always tapers into the filiform beak, which is commonly three or four times the length of the body of the achenium, yet sometimes only double or even barely equal to its length. The leaves vary from

smooth to hairy, from elongated spatulate to linear, from entire or nearly so to pinnately parted into narrow or even into filiform linear segments.

#### 4. *MACRORHYNCHUS HETEROPHYLLUS*, *Nutt.*

*Macrorhynchus* (*Kymapleura*) *heterophyllus*, Nutt. in Trans. Amer. Phil. Soc. n. ser. 7, p. 430.

*M. heterophyllus*, Torr. & Gray, Fl. 2, p. 493; Gray in Pacif. R.R. Surv. 4, p. 115.

*M. Chilensis*, Hook. in Lond. Jour. Bot. 6, p. 256, vix Less.

*Cryptopleura Californica*, Nutt. l. c., p. 431?

HAB. Nisqually, and interior plains of Washington Territory.—The difference in the achenia of Nuttall's two species, great as it is, appears not to be specific.

#### 66. *MULGEDIUM*, *Cass.*

##### 1. *MULGEDIUM PULCHELLUM*, *Nutt.*

HAB. Interior of Washington Territory and Oregon; with most of the leaves runcinate-pinnatifid.

##### 2. *MULGEDIUM LEUCOPHÆUM*, *DC.*

HAB. Puget Sound, and eastward to the Cascade Mountains.

#### 67. *SONCHUS*, *Linn.*

##### 1. *SONCHUS ASPER*, *Vill.*

*Sonchus asper*, Vill., DC., Torr. & Gray, Fl. 2, p. 501.

HAB. San Francisco, California, and on the lower part of the Sacramento: "in wild situations."

## ORD. 44. LOBELIACEÆ.

### 1. DOWNINGIA, Torr. (CLINTONIA, Dougl.)

#### 1. DOWNINGIA ELEGANS, Torr.

*Clintonia elegans*, Lindl. Bot. Reg. t. 1241; A. DC. Prodr. 7, p. 347; Nutt. in Amer. Phil. Trans. n. ser. 8, p. 252.

*C. corymbosa*, A. DC. l. c.

HAB. Interior of Washington Territory and Western Oregon.—Our specimens are mostly dwarfish, being not more than 3 or 4 inches high, but they are probably young. In cultivation it attains a much larger size. Mr. Nuttall states that the taste of the plant is nearly as sweet as that of young lettuce, and that it is greedily cropped by deer and other animals. The sap is watery.

*Downingia pulchella*, the *Clintonia pulchella*, Lindl. Bot. Reg. t. 1909, which occurs both in California and Oregon, is the handsomer species, the larger lips of the corolla much dilated, deeply 3-lobed, and intensely azure-blue, with a large white or yellowish centre.

*Downingia pusilla* (*Clintonia pusilla*, Don) is the Chilian representative of the genus.

In the Botany of Whipple's report [Pacif. R.R. Expl. 4, p. 116] I changed the name given to this genus by Douglas, and published by Lindley, because there is an earlier *Clintonia* of Rafinesque, now generally adopted. [The name adopted was in commemoration of the late Andrew Jackson Downing, of Newburgh, New York, the well-known writer upon horticulture, arboriculture, and landscape gardening.]



## ORD. 45. CAMPANULACEÆ.

### 1. CAMPANULA, *Linn.*

#### 1. CAMPANULA SCOULERI, *Hook.*

*Campanula Scouleri*, Hook. in Alph. DC. Mon. Camp. p. 312, & Fl. Bor.-Am. 2, p. 28, t. 125.

HAB. Washington Territory, around Puget Sound, and eastward to the Cascade Mountains; not found hitherto south of lat. 47°. [It appears to be replaced in California by the nearly related *C. prenanthoides*, Durand, which is *C. filiflora* of Kellogg, and *C. Ræzli* of Regel.]

#### 2. CAMPANULA ROTUNDIFOLIA, *Linn.*

HAB. Common throughout Washington Territory, Oregon, and Northern California.

### 2. SPECULARIA, *Heister.*

#### 1. SPECULARIA PERFOLIATA, *Alph. DC.*

HAB. Washington Territory and Oregon; common; but not yet received from California.

## ORD. 46. ERICACEÆ.

### 1. VACCINIUM, *Linn.*

#### 1. VACCINIUM OVATUM, *Pursh.*

HAB. Washington Territory, in woods around Puget Sound and Gray's Harbor; also on rocks near San Francisco.—A beautiful ever-green shrub, which attains its greatest perfection to the north. At Puget Sound it is sometimes twelve feet high, while in California it is usually only one or two feet. Douglas states that the fruit is black, and pleasant to the taste; while Nuttall remarks that it is dry and scarcely edible.

#### 2. VACCINIUM PARVIFOLIUM, *Smith.*

HAB. Washington Territory; very common in woods about Puget Sound; also in the southern part of British Columbia.—A shrub 6 to 12 feet high, with slender, spreading, much divided, and very angular branches. The leaves are thin, and vary from half an inch to more than an inch in length. The berries are red, and apparently so dry as to be scarcely edible; the cells 15–20-seeded.

#### 3. VACCINIUM MEMBRANACEUM, *Dougl.*

*V. foliis ovato-oblongis utrinque acutiusculis membranaceis serrulatis glabris, adultis nitidis; floribus solitariis modice pedicillatis; corollis globoso-ovatis.*

*Vaccinium membranaceum*, Dougl. ex Hook. Fl. Bor.-Am. 2, p. 32.

*V. myrtilloides*, Hook. l. c. (vars.) excl. syn. Michx.

HAB. Washington Territory, Nisqually, and eastward to the Cascade Mountains.—This species is very distinct from *V. myrtilloides*

of Michaux, which is only a variety of *V. Pennsylvanicum*. It resembles more the larger-leaved forms of *V. myrtillus*. Leaves 1–1½ inches long, veiny and somewhat shining when old. Flowers decandrous. Calyx entire. Berries dark purple, large, and well-flavored. [Ever since it was ascertained that Michaux's plant was a form of *V. Pennsylvanicum*, and therefore his specific name became a synonym, the practice has prevailed of denominating the present species *V. myrtilloides*, Hook., non Michx.]

4. *VACCINIUM CÆSPITOSUM*, Michx.

HAB. Washington Territory, near Nisqually, Puget Sound; also in the timbered country of the Kooskooskee.

5. *VACCINIUM ULIGINOSUM*, Linn.

HAB. On the Klamath River, Oregon.—On the northwest coast this species grows to the height of three or four feet; thus resembling the European plant. In the Atlantic States it occurs on the highest mountains only as a very humble shrub.

2. *ARBUTUS*, Tourn.

1. *ARBUTUS MENZIESII*, Pursh.

*Arbutus Menziesii*, Pursh, Fl. 1, p. 282; Hook. Fl. Bor.-Am. 2, p. 36; DC. Prodr. 7, p. 582; Nutt. Sylv. 3, p. 41, t. 95; Torr. Bot. Mex. Bound. Surv. p. 108; Newberry, Bot. Rep. (in Pacif. R. Road Surv. 6), p. 23.  
*A. procera*, Dougl. ex Lindl. Bot. Reg. t. 1753.

HAB. Oregon and Washington Territory; common along the shores of Puget Sound and on the Columbia River; also in California along the Sacramento and the Bay of San Francisco.—To the north the *Madroña* is a small tree, usually from 20 to 30 feet high, with a trunk

8 to 12 inches in diameter; but in California it is occasionally found 40 to 50 feet high. The wood is hard, tough, and very close-grained, and is wrought into various articles by the natives.—We have specimens of this tree that exactly accord with the character of *A. procera*, but there are intermediate forms, and there is probably but one arborescent *Arbutus* on the northwest coast. If *A. laurifolia*, Linn. f. really came from North America, as is stated in the Supplement (Syst. Veg. ed. 13), and, as Pursh conjectures, from the Pacific shores, it can hardly be distinct from *A. Menziesii*, but unfortunately it is not in the Linnæan herbarium, and there are no certain means of identifying it; nor is it clear how it can have been obtained from that part of the continent at so early a day.

### 3. ARCTOSTAPHYLOS, *Adans.*

#### 1. ARCTOSTAPHYLOS UVA-URSI, *Spreng.*

*Daphnidostaphylos Fendleri*, Klotzsch, in Linnæa, 24, p. 80, fide A. Gray.

HAB. Oregon and Washington Territory; common.

#### 2. ARCTOSTAPHYLOS TOMENTOSA, *Dougl.*

*Arctostaphylos tomentosa*, Dougl. in Lindl. Bot. Reg. t. 1791; DC. Prodr. 7, p. 385; Torr. Bot. Mex. Bound. Surv. p. 108.

*A. cordifolia*, Lindl. l. c. in not.; DC. l. c.

*Arbutus tomentosa*, Pursh, Fl. 1, p. 282; Hook., Fl. Bor.-Am. 1, p. 36, t. 130; Bot. Mag. t. 2320.

*Xerobotrys tomentosus & cordifolius*, Nutt. in Trans. Amer. Phil. Soc. n. ser. 8, p. 268.

*Andromeda? bracteosa*, DC. Prodr. 7, p. 607.

HAB. Puget Sound, and southward to Monterey, California.—This is the *Manzanita* (little apple) of the Mexicans. It is also called California Whortleberry. It is a bush three or four feet high, growing in bunches. The small, depressed, roundish fruit is at first nearly white, which changes to bright red, and at length to very deep purple. It is hardly edible, but is sometimes eaten by Indians.—*Arctostaphylos pumila* and *A. acuta*, Nutt., seem to be only dwarf and small-leaved forms of this variable species.

3. ARCTOSTAPHYLOS PUNGENS, *H. B. K.*

*Arctostaphylos pungens*, H. B. K. Nov. Gen. & Sp. 3, p. 278, t. 259; Lindl. Bot. Reg. (n. ser.) 30, t. 17; Bot. Mag. t. 3927; Torr. in Emory Rep. t. 7, & Bot. Whipl. in Pacif. R. Road Rep. 6, p. 116.

*A. Hookeri*, G. Don, Gen. Syst. 3, p. 836; DC. Prodr. 7, p. 584.

*Arbutus pungens*, Hook. & Arn. Bot. Beechey, p. 144.

*Andromeda? venulosa*, DC. l. c. p. 607.

*Xerobotrys venulosa*, Nutt. l. c. p. 263; Benth. Pl. Hartw. p. 321.

*Daphnidostaphylos pungens & Hookeri*, Klotzsch, in Linnæa 24, p. 81.

HAB. Between the Umpqua River, Oregon, and the Upper Sacramento.—This species, which is usually a shrub only three or four feet high, was seen by Mr. Brackenridge 15 feet high, with a trunk one foot in diameter. Berries red.

4. ARCTOSTAPHYLOS GLAUCA, *Lindl.*

*Arctostaphylos glauca*, Lindl. Bot. Reg. sub. t. 1791.

*Xerobotrys glauca*, Nutt. l. c.

*Daphnidostaphylos glauca*, Klotzsch, l. c.

HAB. Hills on the headwaters of the Sacramento, California.—This form of *Manzanita* seems to be the tallest species of the genus; for it sometimes grows 20 feet high. It branches about a foot above the ground, and is glabrous, usually glaucous throughout. According to Mr. Brackenridge the berries are edible.

4. GAULTHERIA, *Kalm.*1. GAULTHERIA SHALLON, *Pursh.*

HAB. Abundant in woods around Puget Sound, and sparingly as far south as San Francisco. The berries are edible and are made into wholesome cakes by the aborigines.

2. GAULTHERIA MYRSINITES, *Hook.*

*Gaultheria Myrsinites*, Hook. Fl. Bor.-Am. 2, p. 35, t. 129.

HAB. On the Cascade Mountains, Washington Territory: a form with larger leaves and hispid branchlets. Otherwise there seems to be nothing to distinguish our plant from Hooker's. Some of the leaves are more than an inch and a half long and an inch wide.

5. MENZIESIA, *Smith.*1. MENZIESIA FERRUGINEA, *Smith.*

HAB. Washington Territory, from Puget Sound and Gray's Harbor eastward to the Cascade Mountains.—A slender spreading shrub, 4 to 8 feet high, with the habit and foliage of an *Azalea*, and the flowers of a heath.

6. AZALEA, *Linn.*1. AZALEA OCCIDENTALIS, *Torr. & Gray.*

*A. ramulis pubescentibus; foliis obovato-oblongis vel angusto-oblongis, adultis glabris margine ciliolatis, nervo medio hispidulo; floribus (albis) serotinis; calycis lobis oblongis corollæ tubo puberulo limbo æquali.*

*Azalea occidentalis*, Torr. & Gray, in Bot. Whipl. Pacif. R. R. Rep. p. 116; Hook. Bot. Mag. t. 5005.

*A. nudiflora*, Kellogg, in Proceed. Calif. Acad. Nat. Sci. 1, p. 60, non Linn.

*A. calendulacea*, Benth. Pl. Hartw. p. 321, non Michx.

*Rhododendron calendulaceum*, Hook. & Arn. Bot. Beech. p. 362, non Torr.

HAB. Along streams, southern part of Oregon, and along the Upper Sacramento; also in the vicinity of the Bay of San Francisco.

7. RHODODENDRON, *Linn.*1. RHODODENDRON ALBIFLORUM, *Hook.*

*Rhododendron albiflorum*, Hook. Fl. Bor.-Am. 2, p. 43, t. 33, & in Bot. Mag. t. 3670; DC. Prodr. 7, p. 727.

HAB. Cascade Mountains, Washington Territory; the most westerly station known. A handsome shrub, bearing a profusion of white flowers. Anthers 4-celled in the bud.

2. RHODODENDRON MACROPHYLLUM, *G. Don.*

*R. foliis oblongis utrinque acutis subcoriaceis pedicellisque glaberrimis subtus minute reticulatis; floribus racemoso-corymbosis calycis lobis brevissimis obtusis; ovario setoso; filamentis pulverulento-pubescentibus.*

*R. macrophyllum*, G. Don, Gen. Syst. 3, p. 843.

*R. maximum*, Hook. Fl. Bor.-Am. 2, p. 43 (planta Oregona).

HAB. Puget Sound, Washington Territory; in woods; not common.—A noble species, resembling *R. maximum* but quite distinct. It is usually 10 to 15 feet high. Leaves 6 or 7 inches long, and 2 or more inches wide, perfectly smooth on both sides; the under surface paler and very minutely reticulated, tapering at the base to a stout terete petiole which is an inch or more in length, the margins (in dried specimens) slightly and very narrowly revolute. Flowers 10 to 12 in a terminal corymbose raceme, about one-third smaller than those of *R. maximum*. Pedicels unequal in flower, but nearly equal and elongated (2 inches) in fruit. Calyx reduced to a mere 5-toothed border. Corolla campanulate, 5-lobed; the lobes oblong and rounded. Stamens 10: filaments unequal: anthers oblong. Ovary oblong, clothed with rufous short bristly hair: style longer than the stamens: stigma small, simple, obscurely 5-angled. Capsule about three-fourths of an inch long, smooth. Seeds oblong, compressed, narrowly winged all around with a fan-like crenated appendage at the radicular extremity, and acute at the other. Embryo very slender.

8. K A L M I A, *Linn.*1. KALMIA GLAUCA, *Ait.*

HAB. From Puget Sound eastward to the Cascade Mountains, in sphagnous swamps.—It is altogether like the plant of the Northern Atlantic States.

9. L E D U M, *Linn.*1. LEDUM LATIFOLIUM, *Ait.*

HAB. Puget Sound, and interior of Washington Territory.—Similar to the plant of the Northern Atlantic States.

10. P Y R O L A, *Linn.*1. PYROLA ROTUNDIFOLIA, *Linn.*

*Pyrola rotundifolia*, Linn. Spec. p. 396; Michx. Fl. 1, p. 251; Hook. Fl. Bor.-Am.

2, p. 46; DC. Prodr. 7, p. 772; Torr. Fl. N. York, 1, p. 451.

*P. elata*, Nutt. in Trans. Amer. Phil. Soc. n. ser. 8, p. 270.

*P. bracteata*, Hook. l. c. p. 47; Nutt. l. c.

HAB. Oregon and Washington Territory, and, the var. *bracteata*, in the Cascade Mountains.

2. PYROLA CHLORANTHA, *Swartz.*

HAB. Washington Territory, in the Cascade Mountains.



3. PYROLA MINOR, *Linn.*

HAB. Washington Territory, on the eastern side of the Cascade Mountains. A rare plant in North America.

4. PYROLA SECUNDA, *Linn.*

HAB. Mountains in the interior of Washington Territory.

5. PYROLA APHYLLA, *Smith.*

HAB. Nisqually, Puget Sound.—Mr. Nuttall thinks this species makes a near approach to *Pterospora*, and has made a separate section in *Pyrola* to receive it, but it does not differ in the anthers or seeds from the rest of the genus.

11. MONESES, *Salisb.*1. MONESES UNIFLORA, *Gray.*

*Moneses uniflora*, Gray, Man. Bot. ed. 2, p. 260.

*M. grandiflora*, Salisb. in Gray, Arrang. Brit. Pl. 2, p. 403; DC. Prodr. 7, p. 775.

*M. reticulata*, Nutt. l. c.

*Pyrola uniflora*, Linn. Spec. p. 568; Michx. Fl. 1, p. 250; Hook. Fl. Bor.-Am. 2, p. 45; Torr. Fl. N. York, 1, p. 454.

HAB. Puget Sound, and eastward to the mountains.—The western plant was regarded by Nuttall as different from *M. uniflora* of the Eastern States and of Europe. The leaves are, indeed, usually more deeply toothed than in the ordinary form, but not always. The other characters assigned to Nuttall's *M. reticulata* equally occur in most of our specimens of *P. uniflora*.

12. CHIMAPHILA, *Pursh.*1. CHIMAPHILA UMBELLATA, *Nutt.*

HAB. Puget Sound ; common in forests, as in the Northern Atlantic States. The other and peculiar species, *C. Menziesii*, was not collected.

13. MONOTROPA, *Linn.*1. MONOTROPA UNIFLORA, *Linn.*

HAB. Washington Territory, in forests, usually not far from the seacoast. Newly found in the Pacific region and not since met with.

2. MONOTROPA HYPOPITYS, *Linn.*

HAB. Cascade Mountains, Washington Territory.—Variable in color and pubescence as in the eastern plant.

14. PTEROSPORA, *Nutt.*1. PTEROSPORA ANDROMEDEA, *Nutt.*

HAB. Open woods, Oregon and northern part of California.

15. ALLOTROPA, *Torr. & Gray, Nov. Gen.*

*Calyx bibracteolatus, 5-sepalus (sepalis lato-ovatis), persistens. Corolla nulla. Discus fere nullus. Stamina 10, glabra: filamenta filiformia: antheræ breves, bilobæ, fere basifixæ extrorsæ, mox introrsum inversæ pendulæ; loculis rima longitudinali usque ad medium hiantes dehiscentibus. Ovarium globosum, 5-loculare: stylus brevissimus post anthesin elongandus: stigma capitatum, depressum, amplum. Semina numerosissima in placentis axilibus crassis, linearia, nucleo centrali parvo.—Rhizophytum pallidum seu rubellum, carnosum, glabrum,*

*caule spithamæo ad pedalem e basi crassiore squamis ovato-oblongis vel lanceolatis instructo, in spicam virgatam multifloram producto; floribus confertis brevi-pedicellatis albidis.*

1. ALLOTROPA VIRGATA, Torr. & Gray.

HAB. Eastern slope of the Cascade Mountains, Washington Territory.—Plant about 10 inches high, “pale and etiolated,” clothed with linear-lanceolate acute clasping scales which are nearly an inch in length. Raceme about 20-flowered. Calyx a pair of lanceolate sepals, which may perhaps [better] be regarded as bractlets. Petals orbicular, concave, the outermost with a short abrupt point, the others obtuse. Stamens 10 in all the flowers examined. Anthers oblong-ovate. Style almost wanting at first, afterwards more manifest. Fruit too young to show the dehiscence.

[Since rediscovered in Oregon by Elihu Hall, in Northern California by Bolander and Kellogg. Vide Gray, in Pacif. R. R. Surv. 6, p. 81, & Proc. Amer. Acad. 7, p. 368, & 8, p. 394. The genus is here characterized upon the new materials.]

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ORD. 47. STYRACEÆ.

1. STYRAX, Tourn.

1. STYRAX CALIFORNICUM, Torr.

*Styrax Californicum*, Torr. Pl. Frem. in Smithson. Contrib. vol. 6; & Bot. Whipl.

HAB. Valley of the Sacramento, California.—A handsome shrub, with conspicuous white flowers: nearly allied to *S. officinale*. Fruit the size of a small marble, 3-valved from the summit to below the middle.

ORD. 48. PLANTAGINACEÆ.

1. PLANTAGO, *Linn.*

1. PLANTAGO MARITIMA, *Linn.*

HAB. Puget Sound and Gray's Harbor, Washington Territory, and southward to San Francisco.

2. PLANTAGO PATAGONICA, *Jacq.*

HAB. Sandy prairies, Washington Territory and Oregon; the var. *gnaphalioides*, Gray (*P. gnaphalioides*, Nutt.): also, in the Californian collection, a very depauperate state, apparently of this species.

3. PLANTAGO VIRGINICA, *Linn.*, var. MAXIMA.

HAB. California, near San Francisco; the large form, with stout scapes and thick spike; otherwise similar to a common Texan form, *P. purpurascens*, Nutt. It is the *P. Durvillei* of Fischer and Meyer, and probably the plant named by Hooker and Arnott *P. Kamtschatica*.

4. PLANTAGO MAJOR, *Linn.*

HAB. Gray's Harbor, and on the Upper Columbia; probably naturalized from Europe.

## ORD. 49. PLUMBAGINACEÆ.

### 1. STATICE, *Tourn.*

#### 1. STATICE LIMONIUM, *Linn.*

HAB. Bay of San Francisco, California. The var. *Californica*, *S. Californica* of Boissier; apparently only a form of the widely diffused and polymorphous Linnæan species.

### 2. ARMERIA, *Willd.*

#### 1. ARMERIA VULGARIS, *Willd.*

*Armeria vulgaris*, Willd. Enum. Hort. Berol. 1, p. 333.

*A. pubescens & elongata*, Boiss. in DC. Prodr. 12, p. 681.

*A. Andina*, var. *Californica*, Boiss. l. c.; Benth. Pl. Hartw. p. 332.

*Statice Armeria*, Linn. Spec. p. 394.

HAB. Puget Sound and Gray's Harbor, Washington Territory: southward to San Francisco and Monterey.—Seemingly little reliance can be placed on the characters employed by Boissier for distinguishing the species of this and other genera of *Staticeæ*. The list of synonyms given above might be considerably extended.

## ORD. 50. PRIMULACEÆ.

### 1. LYSIMACHIA, *Linn.*

#### 1. LYSIMACHIA CILIATA, *Linn.*

HAB. Upper Columbia River, near Fort Okanagan.—It is wholly similar to the plant of the Atlantic States.

### 2. NAUMBURGIA, *Moench.*

#### 1. NAUMBURGIA THYRSIFLORA, *Reich.*

HAB. Fraser's River, British Columbia, *Dr. Holmes*.—The minute teeth between the divisions of the corolla are often wanting in the European as well as in the North American plant.

### 3. TRIENTALIS, *Linn.*

#### 1. TRIENTALIS EUROPÆA, *Linn.*

*T. latifolia*, Hook. Fl. Bor.-Am. 2, p. 121; Duby in DC. Prodr. 8, p. 59.

HAB. Puget Sound; in woods; also in the Redwood groves near San Francisco, California.—Our specimens show a gradual transition from the ordinary state of *T. Europæa* to *T. latifolia*. The rhizoma in a small oblong tuber. In the only Californian specimens the leaves are in four distinct whorls of 5 to 7 each; which is a very unusual occurrence.

4. DODECATHEON, *Linn.*1. DODECATHEON MEADIA, *Linn.*

*Dodecatheon Media*, Linn. Spec. p. 207; Bot. Mag. t. 12, Pursh, Fl. 1, p. 136; Duby in DC. Prodr. 8, p. 56.

*D. integrifolium*, Michx. Fl. 1, p. 123; Hook. Fl. Bor.-Am. 2, p. 118; Duby l. c.; Benth. Pl. Hartw. p. 322.

*D. frigidum*, Cham. in Linnæa 1, p. 217; Hook. l. c.; Duby l. c.

HAB. Washington Territory and Oregon; in prairies.—The species which we have here united must all be referred to one, as our extensive series of specimens from very many localities abundantly proves. Probably *D. dentatum* should be united with them.

5. DOUGLASIA, *Lindl.*1. DOUGLASIA NIVALIS, *Lindl.*

*Douglasia nivalis*, Lindl. in Brande, Jour. Sci. 1828, p. 383, & Bot. Reg. t. 1886; Hook. Ic. t. 180, & Fl. Bor.-Am. 2, p. 120; Gray in Proc. Amer. Acad. 7, p. 371.

HAB. Near Fort Okanagan on the Upper Columbia; rare in dry prairies, forming large patches.—This is a very rare plant, having been found hitherto only by Douglas, Richardson, and the botanists of the United States Exploring Expedition. Dr. Gray has identified the genus with *Gregoria* of Duby, and has noted that, as *Douglasia* was published in Brande's Journal for 1827 (not 1828), this name has a clear priority.

## ORD. 51. LENTIBULARIACEÆ.

### 1. UTRICULARIA, *Linn.*

#### 1. UTRICULARIA VULGARIS, *Linn.*

HAB. Nisqually, Washington Territory.—Apparently identical with the Eastern American and European species.

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## ORD. 52. OROBANCHACEÆ.

### 1. PHELIPÆA, *Tourn.*

#### 1. PHELIPÆA COMOSA, *Torr. & Gray.*

*Phelipæa comosa*, Torr. & Gray in Torr. Bot. Mex. Bound. Surv. p. 110.

*Anoplanganthus comosus*, Walp. Rep. 3, p. 480; Reut. in DC. Prodr. 11, p. 41.

*Orobanche comosa*, Hook. Fl. Bor.-Am. 2, p. 92, t. 169.

HAB. Valley of the Willamette, Oregon; southward to San Francisco.—Corolla pale lilac color externally, purple with reddish veins inside the lobes; lower lip deeply 3-parted, the lobes entire, not bidentate as they are represented in the figure of Hooker. So they generally are in all our specimens of this plant, except in a specimen received from Sir William; probably a duplicate from Douglas's collection. The bracteoles are sometimes close to the calyx, but often remote and alternate.



2. APHYLLON, *Mitchell*.1. APHYLLON UNIFLORUM, *Torr. & Gray*.

*Aphyllon uniflorum*, Torr. & Gray; Gray, Man. Bot. ed. 2, p. 281.

*Anoplanthus uniflorus*, Endl. Icon. Gen. t. 72; Reuter in DC. Prodr. 11, p. 41.

HAB. Nisqually and Port Discovery, Washington Territory; southward to California. The genus is hardly distinct enough from *Phelipæa*.

2. APHYLLON FASCICULATUM, *Torr. & Gray, l. c.*

*Anoplanthus fasciculatus*, Walp. Rep. 3, p. 480; Reuter l. c.

*Orobanche fasciculata*, Nutt. Gen. 2, p. 59; Hook. Fl. Bor.-Am. 2, p. 93, t. 170.

HAB. Between the mouth of the Spokane River and Fort Colville, Washington Territory.

## ORD. 53. SCROPHULARIACEÆ.

1. LINARIA, *Juss.*1. LINARIA CANADENSIS, *Dum. Cours.*

HAB. Gray's Harbor, Washington Territory, and southward to San Francisco; usually not far from the sea-coast.

2. ANTIRRHINUM, *Linn.*1. ANTIRRHINUM GLANDULOSUM, *Lindl.*

*Antirrhinum glandulosum*, Bot. Reg. t. 1893; Benth. l. c. p. 291.

HAB. Near San Francisco, California.

2. ANTIRRHINUM CORNUTUM, *Benth.*

*Antirrhinum cornutum*, Benth. Pl. Hartw. p. 328; Gray in Proc. Amer. Acad. 7, p. 373.

HAB. Valley of the Sacramento, where it has since been collected by Hartweg.

3. SCROPHULARIA, *Linn.*1. SCROPHULARIA NODOSA, *Linn.*

HAB. Puget Sound southward to San Francisco.—We have no specimens from the interior country. It is quite as variable on the western coast as in the Atlantic States.

4. COLLINSIA, *Nutt.*1. COLLINSIA PARVIFLORA, *Dougl.*

*Collinsia parviflora*, Dougl. in Lindl. Bot. Reg. t. 1082; Benth. in DC. Prodr. 10, p. 318.

HAB. In prairies; Nisqually, Port Discovery, &c., Washington Territory.

5. PENTSTEMON, *L'Her.*1. PENTSTEMON SCOULERI, *Dougl.*

*Pentstemon Scouleri*, Dougl. in Lindl. Bot. Reg. t. 1277; Benth. in DC. Prodr. 10, p. 320.

HAB. Banks of the Spipen River, east of the Cascade Mountains.—This rare and handsome species forms small beds of procumbent stems, which throw up erect branches of about a foot in height. The leaves in most of the specimens are entire, but in some cases they are denticulate-serrate.

2. PENTSTEMON GAIRDNERI, *Hook.*

*Pentstemon Gairdneri*, Hook. Fl. Bor.-Am. 2, p. 49; Benth. in DC. Prodr. 10, p. 321.

HAB. Banks of the Spipen River, Washington Territory.—Hitherto this plant has been known only from the specimens collected by Douglas more than thirty years ago on the "Blue Mountains;" probably on the Upper Columbia. These were in fruit with some withered flowers. All of our specimens are in full flower. Sir William Hooker states that the species is remarkable for its alternate leaves and pedicels, and so they are most commonly; but in some instances the leaves (which are crowded) are opposite. The pedicels are occasionally 2-flowered. The corolla is about three-fourths of an inch long, tubular-campanulate; the limb somewhat two-lipped, with the lobes rounded.

3. PENTSTEMON SPECIOSUS, *Dougl.*

*Pentstemon speciosus*, Dougl. in Lindl. Bot. Reg. t. 1270; Hook. Fl. Bor.-Am. 2, p. 98; Benth. in DC. Prodr. 10, p. 322.

HAB. Sandy alluvions of the Upper Columbia and its tributaries.

4. PENTSTEMON DEUSTUS, *Dougl.*

*Pentstemon deustus*, Dougl. in Bot. Reg. t. 1318; Hook. Fl. Bor.-Am. 2, p. 96;  
Benth. in DC. Prodr. 10, p. 328.

HAB. Spokane River, Washington Territory.—A small-flowered species, remarkable for the strong sharp serratures of the leaves. Stem woody at the base.

5. PENTSTEMON CONFERTUS, *Dougl.*

*Pentstemon confertus*, Dougl. in Bot. Mag. t. 2954; Benth. in DC. Prodr. 10, pp. 328 & 593.

HAB. Interior of Washington Territory and Oregon; common.

6. PENTSTEMON CORYMBOSUS, *Benth.*

*P. pubescens*; caule e basi ramoso; foliis oblongis basi in petiolem brevius attenuatis obtusiusculis integerrimis vel remote denticulatis; cyma terminali corymbiformi; corollæ tubo angusto calyce subtriplo longiore; limbo bilabiato; filamento sterili barbato.

Var. *humilis*, fruticulosus; foliis angusto-oblongis; cyma nuda pluriflora: forma normalis Benth.

Var. *robustus*, fere herbaceus; foliis ovato-oblongis; cyma basi foliosa multiflora.

HAB. The smaller variety, Southern Oregon, probably near the borders of California; the larger variety, Hills of the Upper Sacramento, California. The low variety is identical with Coulter's No. 629, from which Bentham's description of *P. corymbosus* was doubtless taken. In an authentic specimen of that plant, however, the sterile filament is not smooth, but strongly bearded. Our specimens of this variety are clearly shrubby, for, besides showing the woody structure, they bear vestiges of the inflorescence of the preceding season

The larger variety is a much stouter plant, the branches being from a foot to eighteen inches long, and the leaves more than an inch in length. The cymes are compound, and 12-40-flowered, with a pair of leaves at the base of the lower branches. According to Mr. Brackenridge the flowers are scarlet and very showy.

7. *PENTSTEMON TRIPHYLLUS*, Dougl.

*Pentstemon triphyllus*, Dougl. in Bot. Reg. t. 1245; Hook. Fl. Bor.-Am. 2, p. 96; Benth. in DC. Prodr. 10, p. 329.

HAB. On the Walla-Walla River, Oregon; the only region where this rare species has hitherto been found.

8. *PENTSTEMON RICHARDSONI*, Dougl.

*Pentstemon richardsoni*, Dougl. in Lindl. Bot. Reg. t. 1121; Hook. Bot. Mag. t. 3391, & Fl. Bor.-Am. 2, p. 96; Benth. in DC. Prodr. 10, p. 330.

HAB. On the Walla-Walla River, Oregon.

9. *PENTSTEMON VENUSTUS*, Dougl.

*Pentstemon venustus*, Dougl. in Lindl. Bot. Reg. t. 1309; Hook. Fl. Bor.-Am. 2, p. 95; Benth. in DC. Prodr. 10, p. 330.

HAB. On the Walla-Walla and Kooskooskee Rivers.—In the specimens from the latter station the filaments are all smooth, but in other respects there is little difference.

10. *PENTSTEMON DIFFUSUS*, Dougl.

*Pentstemon diffusus*, Dougl. in Bot. Reg. t. 1132, & t. 3645; Hook. Fl. Bor.-Am. p. 95; Benth. in DC. Prodr. 10, p. 330.

HAB. East of the Cascade Mountains in Washington Territory.—Our plant differs from the description of this species by Bentham, in the anthers being hispid at the summit; but we find the same character in a cultivated but authentic specimen of *P. diffusus*.

11. PENTSTEMON GLANDULOSUS, *Lindl.*

*Pentstemon glandulosus*, Lindl. Bot. Reg. t. 1262; Hook. Fl. Bor.-Am. 2, p. 95;  
Bot. Mag. t. 3688; Benth. in DC. Prodr. 10, p. 330.

HAB. Banks of the Kooskooskee, Washington Territory.

12. PENTSTEMON OVATUS, *Dougl.*

*Pentstemon ovatus*, Dougl. in Bot. Mag. t. 2903; Bot. Cab. t. 1626; Benth. in DC.  
Prodr. 10, p. 329.

HAB. On the Upper Columbia, Washington Territory.—The specimens are dwarfish, and the leaves are narrower than usual. The flowers, also, are said to be white; but there can be little doubt that the plant is a state of *P. ovatus*.

[Since the above account was prepared, the genus *Pentstemon* has been monographed in the Proceedings of the American Academy of Arts and Sciences, vol. 5, 1862.]

6. MIMULUS, *Linn.*1. MIMULUS CARDINALIS, *Dougl.*

*Mimulus cardinalis*, Dougl. in Benth. Scroph. Ind. p. 28 (in adnot.); Trans. Hort.  
Soc. Lond. ser. 2, 5, t. 3; Bot. Mag. t. 3560; Benth. in DC. Prodr. 10, p. 370.

HAB. Valley of the Sacramento, California.

2. MIMULUS LUTEUS, *Linn.*

*Mimulus luteus*, Linn. Spec. p. 884; Bot. Mag. t. 1501, 3336, & 3363; Bot. Reg. t.  
1080, 1796; Benth. in DC. Prodr. 10, p. 370.  
*M. rivularis*, Nutt. in Journ. Acad. Sc. Philad. 7, p. 47.

HAB. California, and northward to Fraser's River; common. Also a native of Chili.

3. *MIMULUS ALSINOIDES*, Dougl.

*Mimulus alsinoides*, Dougl. in Benth. Scroph. Ind. p. 29, adnot; Benth. in DC. Prodr. 10, p. 372.

HAB. Spipen River, Washington Territory; on mossy banks.—This is the smallest species of the genus. Our specimens are only two inches high. [They probably belong to *M. microphyllus*, Benth.]

4. *MIMULUS FLORIBUNDUS*, Dougl.

*Mimulus floribundus*, Dougl. in Lindl. Bot. Reg. t. 1125; Hook. Fl. Bor.-Am. 2, p. 99; Benth. in DC. Prodr. 10, p. 372.

HAB. On the Columbia River, from Walla-Walla to Fort Okanagan; a small form. Valley of the Sacramento; a form with stems a foot or more in length, and diffuse.

5. *MIMULUS MOSCHATUS*, Dougl.

*Mimulus moschatus*, Dougl. in Lindl. Bot. Reg. t. 1118; Hook. Fl. Bor.-Am. 2, p. 99; Benth. in DC. Prodr. 10, p. 372.

HAB. Washington Territory and Oregon, where it is throughout common.

6. *MIMULUS (DIPLACUS) GLUTINOSUS*, Wendl.

*Mimulus glutinosus*, Wendl. Obs. p. 51; Jacq. Hort. Schœnbr. 3, t. 364; Gray in Bot. Mex. Bound. p. 117.

*Diplacus glutinosus*, Nutt. in Tayl. Ann. Nat. Hist. 1, p. 137; Benth. in DC. Prodr. 10, p. 368.

*D. latifolius*, *leptanthus* & *longiflorus*, Nutt. l. c.; Benth. l. c.

HAB. Valley of the Sacramento, and near San Francisco, California.—There can be no doubt that all of Nuttall's species of *Diplacus* pass into each other by insensible gradations. [It is ascertained that the placentæ are really parietal in *Diplacus*, so that the genus will be maintained.]

7. ILYSANTHES, *Raf.*1. ILYSANTHES GRATIOLOIDES, *Benth.*

HAB. On the Upper Sacramento, California; rare.—Both broad and narrow-leaved forms occur among the specimens. This plant has not before been observed in the Pacific States.

8. SYNTHYRIS, *Benth.*1. SYNTHYRIS RUBRA, *Benth.*

*Synthyris rubra*, Benth. in DC. Prodr. 10, p. 455.

*Gymnandra rubra*, Hook. Fl. Bor.-Am. 2, p. 103, t. 172.

HAB. Spokane River, Washington Territory; in prairies.—Our specimens have both flowers and fruit; the capsule and seeds resemble those of the other species. The plant turns blackish in drying.

9. VERONICA, *Linn.*1. VERONICA AMERICANA, *Schweinitz, Benth.*

HAB. Upper Columbia, Washington Territory, and near San Francisco, California.

2. VERONICA SCUTELLATA, *Linn.*

HAB. Gray's Harbor and Satchap River, Washington Territory.



3. *VERONICA ARVENSIS*, *Linn.*

HAB. Plains east of the Cascade Mountains, Washington Territory.

4. *VERONICA PEREGRINA*, *Linn.*5. *VERONICA SERPYLLIFOLIA*, *Linn.*

HAB. Upper Columbia and its tributaries; also in California.

10. *ORTHOCARPUS*, *Nutt.*1. *ORTHOCARPUS PUSILLUS*, *Benth.*

HAB. Nisqually and Port Discovery, Puget Sound; common in prairies.

2. *ORTHOCARPUS HISPIDUS*, *Benth.*

HAB. Near Fort Okanagan, Upper Columbia; also between Fort Colville and Spokane River. A smoother and more slender form was found at Nisqually, Puget Sound.

3. *ORTHOCARPUS TENUIFOLIUS*, *Benth.*

HAB. Valley of the Upper Columbia and its tributaries, Washington Territory.

4. *ORTHOCARPUS DENSIFLORUS*, *Benth.*

HAB. Nisqually, Puget Sound, and elsewhere in Washington Territory and Oregon.

11. CASTILLEIA, *Linn. f.*1. CASTILLEIA FOLIOLOSA, *Hook. & Arn.*

HAB. Near San Francisco, California.—This species is annual, as I have stated elsewhere, although it is called suffruticose by Bentham.

2. CASTILLEIA PALLIDA, *Kth.*

HAB. Puget Sound, and eastward to the Spokane River, Washington Territory.—*C. septentrionalis*, Lindl. differs from this species chiefly in the shorter leaves and longer upper lip of the corolla.

3. CASTILLEIA MINIATA, *Dougl. in Hook.*

HAB. Throughout Washington Territory and Northern Oregon, from the Pacific to the Rocky Mountains.—It is probable this is the *C. acuminata*, Spreng. (*Bartsia acuminata*, Pursh), unless that be *C. pallida*. The question cannot be settled except by the inspection of Pursh's original specimens. From *C. pallida* our plant is well distinguished by the long upper and very short lower lip of the corolla. In this respect it accords with *C. septentrionalis*, of which it is, perhaps, merely a variety.

4. CASTILLEIA PARVIFLORA, *Bongard.*

HAB. Near Gray's Harbor, Washington Territory. [To this the following has been joined.]

5. CASTILLEIA HISPIDA, *Hook.*

HAB. Oregon and Washington Territory; abundant in prairies.—A highly ornamental species, resembling *C. coccinea*; the bracts usually red, but sometimes bright yellow.

12. CORDYLANTHUS, *Nutt.*1. CORDYLANTHUS FILIFOLIUS, *Nutt., Benth.*

HAB. Plains of the Sacramento, California, and on the Rogue River, Southern Oregon. [The genus has since been monographed in the Proceedings of the American Academy, 7, p. 381, and in the Botany of C. King's Exploration.]

13. RHINANTHUS, *Linn.*1. RHINANTHUS CRISTA-GALLI, *Linn.*

HAB. Gray's Harbor, and on the Kooskooskee River, Washington Territory.

14. PEDICULARIS, *Tourn.*1. PEDICULARIS RACEMOSA, *Dougl.*

*Pedicularis racemosa*, Dougl. in Hook. Fl. Bor.-Am. 2, p. 108; Benth. in DC. Prodr. 10, p. 580.

HAB. Cascade Mountains of Washington Territory.—Plant about a foot and a half high, growing in tufts. A rare and neat species; not found before, since it was discovered by Douglas.

2. PEDICULARIS DENSIFLORA, *Benth.*

*Pedicularis densiflora*, Benth. in Hook. Fl. Bor.-Am. 2, p. 110, & in DC. Prodr. 10, p. 575.

HAB. Cascade Mountains of Washington Territory.—The specimens are immature, but there can be little doubt of the species.

ORD. 54. VERBENACEÆ.

1. VERBENA, *Linn.*

1. VERBENA HASTATA, *Linn.*

HAB. Marshes on the Lower Sacramento, California. [Not otherwise known from the Pacific side of the continent.]

2. VERBENA BRACTEOSA, *Michx.*

HAB. On the Walla-Walla River, Oregon; extending to California.

3. VERBENA PROSTRATA, *R. Brown.*

HAB. On the Lower Sacramento; a common and peculiar Californian species.

2. LIPPIA, *Linn.*

1. LIPPIA LANCEOLATA, *Michx.*

HAB. Valley of the Sacramento, California.—Apparently identical with the Atlantic States species.

## ORD. 55. LABIATÆ.

### 1. MENTHA, *Linn.*

#### 1. MENTHA CANADENSIS, *Linn.*

HAB. Gray's Harbor, Washington Territory, southward to San Francisco.—Smooth and very downy varieties occur in the collection. Some of the forms approximate very closely to *M. arvensis*.

### 2. LYCOPUS, *Tourn.*

#### 1. LYCOPUS VIRGINICUS, *Linn.*

HAB. Near Gray's Harbor, Washington Territory; never found before so far west.

#### 2. LYCOPUS SINUATUS, *Ell.*

HAB. Nisqually, Washington Territory, and on the Lower Sacramento, California; in marshes.

### 3. PYCNANTHEMUM, *Michx.*

#### 1. PYCNANTHEMUM CALIFORNICUM, *Torr.*

*Pycnanthemum Californicum*, Torr. in Durand, Pl. Pratt. in Jour. Acad. Philad. n. ser. 2, p. 99, & Pl. Whipl. in Pacif. R. Road. Expl. 4, p. 122.

HAB. Umpqua River, Oregon, and on the Upper Sacramento, California. This solitary representative of the genus *Pycnanthemum* on the Pacific side of the Continent grows further north than we had supposed, and seems to be a pretty common species. It is most nearly related to *P. muticum*, but very distinct. The flowers are pale purple.

4. M O N A R D E L L A, *Benth.*1. MONARDELLA ODORATISSIMA, *Benth.*

*Monardella odoratissima*, Benth. Lab. p. 322, & in DC. Prodr. 12, p. 190; Hook. Fl. Bor.-Am. 2, p. 113.

HAB. On the Kooskooskee River, Washington Territory, and near Fort Walla-Walla on the Columbia.—In our solitary specimen from the Kooskooskee the leaves are narrower, and remotely and conspicuously denticulate. This species is suffruticose; throwing up from a prostrate base numerous branching stems 12 to 15 inches high.

2. MONARDELLA VILLOSA, *Benth.*

*Monardella villosa*, Benth. Bot. Sulph. p. 42, t. 21, & in DC. Prodr. 12, p. 191; Torr. Bot. Mex. Bound. Surv. p. 129.

HAB. Sides of Mount Palmas, near San Francisco, California.—Late in the season clusters of very small leaves, on short branches, are formed on the lower part of the stem. Flowers bright rose color.

5. M I C R O M E R I A, *Benth.*1. MICROMERIA DOUGLASII, *Benth.*

*Micromeria Douglasii*, Benth. Lab. p. 372; & in DC. Prodr. 12, p. 223; Hook. Fl. Bor.-Am. 2, p. 114.

HAB. Puget Sound, and southward to San Francisco.—The slender prostrate branches are sometimes 2 or 3 feet long. Leaves very variable in size. This is the *Yerba Buena* of the Californians.

6. POGOGYNE, *Benth.*1. POGOGYNE DOUGLASII, *Benth.*

*Pogogyne Douglasii*, Benth. Lab. p. 414; & in DC. Prodr. 12, p. 243; Torr. Pl. Whipl. in Pacif. R. Road. Expl. 4, p. 123; & Bot. Mex. Bound. p. 129.

HAB. Valley of the Upper Sacramento, California; on the banks of the river.—We have elsewhere stated that there is probably but one species of *Pogogyne* [*i. e.* of this group], and this opinion is confirmed by a re-examination of the genus.

7. AUDIBERTIA, *Benth.*1. AUDIBERTIA INCANA, *Benth.*

*Audibertia incana*, Benth. in Bot. Reg. 17, t. 1469; & in DC. Prodr. 12, p. 359; Hook. Fl. Bor.-Am. 2, p. 112.

HAB. Upper Columbia, Washington Territory.—A shrub 3 to 6 feet high, with numerous spreading branches. Flowers pale purplish-blue, rather ornamental.

8. LOPHANTHUS, *Benth.*1. LOPHANTHUS URTICIFOLIUS, *Benth.*

*Lophanthus urticifolius*, Benth. in Bot. Reg. 15, not. sub no. 1282; & in DC. Prodr. 12, p. 368; Hook. Fl. Bor.-Am. 2, p. 115.

HAB. On the Spipen and Kooskooskee Rivers, Washington Territory.—Resembles *L. nepetoides*, but easily distinguished by the very long subulate teeth of the calyx.

9. P R U N E L L A, *Tourn.*1. PRUNELLA VULGARIS, *Linn.*

HAB. Common in Oregon and Washington Territory, as in all the cool temperate regions.

10. S C U T E L L A R I A, *Linn.*1. SCUTELLARIA ANGUSTIFOLIA, *Pursh.*

*Scutellaria angustifolia*, Pursh Fl. 2, p. 412; Benth. Lab. p. 436, & in DC. Prodr. 12, p. 424; Hook. Fl. Bor.-Am. 2, p. 115.  
*S. antirrhinoides*, Benth. l. c. p. 428; Hook. l. c.

HAB. On the Upper Columbia and Kooskooskee Rivers.—After examining a pretty extensive series of specimens of *S. angustifolia* and *S. antirrhinoides*, I am convinced they should be united, as there are many intermediate states. The prior name of Pursh is inapplicable to the broad-leaved forms, but it must be retained. The leaves, especially the lower ones, are often strongly serrate-toothed.

2. SCUTELLARIA GALERICULATA, *Linn.*

HAB. Fraser River, British Columbia, and southward.

3. SCUTELLARIA LATERIFLORA, *Linn.*

HAB. Gray's Harbor, Washington Territory; thence across the continent.



11. STACHYS, *Linn.*1. STACHYS PALUSTRIS, *Linn.*, var.

HAB. Fraser River (Dr. Holmes) and southward to California.—Differs from the typical *S. palustris*, in the conspicuously petiolate and broader leaves, as well as in the larger flowers. The tube of the corolla is three times the length of the calyx.

2. STACHYS SYLVATICA, *Linn.*

HAB. Puget Sound and Gray's Harbor, Washington Territory.—This agrees so nearly with our authentic European specimens of *S. sylvatica* that we have no doubt of their identity. It is also very near the *S. cordata* of Riddell, which Dr. Gray regards as an extreme form of *S. palustris*.

3. STACHYS AJUGOIDES, *Benth.*

*Stachys ajugoides*, Benth. in Linnæa, 6, p. 80, & in DC. Prodr. 12, p. 474.

HAB. Valley of the Sacramento, and near San Francisco, California.

4. STACHYS PYCNOSTACHYA, *Benth.*

*Stachys pycnostachya*, Benth. Pl. Hartweg, p. 331.

HAB. Valley of the Sacramento, California.—This species varies in its pubescence from almost hispidly-hirsute to whitish-tomentose.

5. STACHYS CHAMISSONIS, *Benth.*

*Stachys Chamissonis*, Benth. in Linnæa, 6, p. 80, & in DC. Prodr. 12, p. 468.

HAB. Near San Francisco, California, where it was collected by Chamisso.

6. STACHYS AGRARIA, *Cham. & Schlecht.*

*Stachys agraria*, Cham. & Schlecht. in *Linnaea*, 5, p. 100.

HAB. Near San Francisco, California.—Except in being more hairy the plant scarcely differs from our Texan specimens of this species.

12. TEUCRIUM, *Linn.*1. TEUCRIUM CANADENSE, *Linn.*

*Teucrium Canadense*, Linn. Spec. p. 789; Michx. Fl. 2, p. 1; Torr. Fl. N. York, 2, p. 82; Benth. in DC. Prodr. 12, p. 581.

HAB. Valley of the Sacramento, California; not rare in marshes along the river; not found before in the Pacific States.

13. TRICHOSTEMA, *Linn.*1. TRICHOSTEMA LANCEOLATUM, *Benth.*

*Trichostema lanceolatum*, Benth. Lab. p. 659, & in DC. Prodr. 12, p. 573; Hook. Fl. Bor.-Am. 2, p. 117.

HAB. Umpqua River, Oregon, and Valley of the Sacramento, California.—The root is certainly annual, and so it seems to be also in *T. lanatum*.

## ORD. 56. BORRAGINACEÆ.

### 1. HELIOTROPIMUM, *Tourn.*

#### 1. HELIOTROPIMUM CURASSAVICUM, *Linn.*

HAB. Valley of the Sacramento, California.—This almost cosmopolite plant is more common, and occurs at a much higher latitude, on the western coast than in the Atlantic States. A broad-leaved variety was found by Douglas on the Columbia River.

### 2. TIQUILIA, *Pers.*

*Calyx quinquepartitus. Corolla tubuloso-infundibuliformis; limbo 5-lobo, lobis ovalibus obtusis; fauce nuda. Stamina 5, inclusa, medio tubi corollæ inserta. Stylus ultra medium bipartitus, ramis filiformibus; stigmata capitellata. Nuculæ 4, oblongæ, glabræ, dorso convexæ, intus angulares, inferne stylo adnatæ, superne liberæ. Cotyledones a basi sursum profunde bipartita! Herbæ annuæ dichotome ramosæ, foliis ovatis vel ellipticis; floribus in glomerulis sessilibus axillaribus.*

TIQUILIA, *Pers. Syn.* 1, p. 157.

COLDENIA, *sect. 2, TIQUILIA, DC. Prodr.* 9, p. 558.

#### 1. TIQUILIA BREVIFOLIA, *Nutt.* (Tab. 12, A.)

*Tiquilia brevifolia*, *Nutt. MSS.*; *Torr. Bot. Mex. Bound. Surv.* p. 136.  
*Coldenia? Nuttallii*, *Hook. Lond. Jour. Bot. & Kew Misc.* 3, p. 296.

HAB. On the Walla-Walla River, Washington Territory.—Stem 2 to 6 inches long, much branched, usually prostrate. Leaves ovate, clustered at the forks of the stem, 3 or 4 lines long, hairy, and at length hispid, the nerves somewhat depressed on the upper surface: petioles 1 or 2 lines long. Flowers in small axillary dense clusters. Sepals narrowly lanceolate, hispid, with a few stouter spinose hairs at the tip. Corolla twice as long as the calyx; the lobes obtuse and somewhat spreading. Stamens inserted about the middle of the tube. Ovary subglobose, 4-lobed. Style filiform, 2-parted below the middle. Nutlets ovate-oblong, gray, homomorphous, and all fertile, obtusely angular and grooved on the face where they adhere to the base of the style. Albumen none. Cotyledons deeply 2-lobed from the base nearly to the apex, the radicle originating below the cleft, surrounded by the four lobules, and protruding beyond them. The cotyledons may, perhaps, be regarded as excessively auriculate at the base.

The genus *Tiquilia* was established by Persoon on the *Lithospermum dichotomum* of Ruiz & Pavon, and was doubtfully regarded as a section of *Coldenia* by De Candolle. The latter genus differs in its nearly solitary flowers, nutlets connate in pairs, very short style, which is 2-parted at the base, and undivided cotyledons. It is more nearly related, however, to *Galapagoa*, Hook. f., and has much the aspect of *G. fusca*, which is also an annual, like *Tiquilia*, although called perennial by Dr. Hooker. *Galapagoa* differs chiefly in the stamens being inserted at the base of the corolla, the style 2-parted at the base, and the undivided cotyledons.

[In the fifth volume of the Proceedings of the American Academy of Arts and Sciences, p. 341 (1862), this plant is characterized by the present writer under the name of *Coldenia (Tiquiliopsis) Nuttallii*, Hook.]

PLATE 12, A. TIQUILIA BREVIFOLIA; on the plate, T. OREGANA. Plant of the natural size. Fig. 1. A flower. 2. Corolla laid open. 3. A calyx-lobe. 4. Pistil. 5. Same in fruit. 6. Same with all the nutlets but one removed. 7. Nutlet, seen from the inside. 8. Lateral view; the thin pericarp longitudinally divided. 9. Transverse section of seed through the four divisions of the cotyledons surrounding the radicle. 10. Seed entire. 11, 12. The embryo. The details variously enlarged.

3. LITHOSPERMUM, *Tourn.*1. LITHOSPERMUM RUDERALE, *Dougl.*

*Lithospermum ruderale*, Dougl. in Lehm. Pug. 2, p. 28; Lehm. in Hook. Fl. Bor.-Am. 2, p. 89; DC. Prodr. 10, p. 79.

*L. pilosum*, Nutt. in Jour. Acad. Phil. 7, p. 43.

HAB. Puget Sound, and interior of Washington Territory, east of the Cascade Mountains.

4. MERTENSIA, *Roth.*1. MERTENSIA SIBIRICA, *Don.*

*Mertensia Sibirica* (& *M. denticulata*), G. Don. Gen. Syst. Bot. 4, p. 319; DC. Prodr. 10, p. 90; Gray in Sill. Jour. 34, p. 340.

*Pulmonaria Sibirica*, Linn., fide A. Gray, l. c.; Pursh. Fl. 2, p. 729.

*Lithospermum denticulatum*, Lehm. Asperif., & in Hook. Fl. Bor.-Am. 2, p. 87.

HAB. Washington Territory, around Puget Sound; in rich soil.

2. MERTENSIA OBLONGIFOLIA, *DC.*

*Mertensia oblongifolia*, DC. l. c.; Hook. Kew. Jour. Bot. 3, p. 295; Gray, l. c.

*Pulmonaria oblongifolia*, Nutt. in Jour. Acad. Philad. 7, p. 43.

HAB. On the Kooskooskee River, Washington Territory; in low grounds: flowering in February; Rev. Mr. Spalding. A broad-leaved form.

5. MYOSOTIS, *Linn.*1. MYOSOTIS VERNA, *Nutt.*

HAB. Sand banks of the Columbia River; flowering in May; Rev. Mr. Spalding.

6. AMSINCKIA, *Lehm.*1. AMSINCKIA LYCOPSOIDES, *Lehm.*

*Amsinckia lycopsoides*, Lehm. Delect. Sem. Hort. Hamb. 1836, p. 7; DC. Prodr. 10, p. 117.

*Lithospermum lycopsoides*, Lehm. Pug. 2, p. 28, & in Hook. Fl. Bor.-Am. 2, p. 89.

HAB. Shores of Puget Sound, and interior of Washington Territory; southward to San Diego, California.—In the Botany of the Mexican Boundary I remarked that perhaps all the species of this genus with rugose nutlets may be forms of *A. lycopsoides*. Whatever doubt may yet remain on this subject, I believe that all the other species of De Candolle's *Prodromus*, with the exception of *A. vernicosa* (which is easily distinguished by its perfectly smooth, shining, and acute nutlets), may be reduced to a single one. The nutlets vary considerably, and are sometimes scarcely at all rugose on the back. No doubt *A. Douglasiana* of Alph. De Candolle is the same as *A. spectabilis* of Hooker & Arnott. Specimens of *A. angustifolia* (from Valparaiso, *Matthews*), given to me in 1833 by Lindley, cannot be distinguished from what has been called *A. intermedia* of California. No dependence can be placed on the position of the stamens in the tube of the corolla, as I have shown in the Botany of Whipple's Report, p. 124.

## 7. PIPTOCALYX, Nov. Gen.

*Calyx æqualiter 5-fidus, infra medium transverse deciduus, basi persistente membranacea obtuse 5-dentata. Corolla tubuloso-infundibuliformis, fauce nuda. Stamina 5, inclusa: filamenta medio corollæ inserta: antheræ ovatæ, basi sagittatæ. Nuculæ ovatæ, acutæ, glaberrimæ, dorso convexæ, angulo interno stylo inferne adnatæ. Stylus brevissimus: stigma capitellatum.—Herba Californica, pusilla, ramosissima, annua; foliis linearibus; floribus in cymulis foliosis brevissimis terminalibus.*

## 1. PIPTOCALYX CIRCUMSCISSUS. (Tab. 12, B.)

*Lithospermum? circumscissum*, Hook. & Arn. Bot. Beech. p. 370; DC. Prodr. 10, p. 84.

HAB. Walla-Walla and Upper Columbia, Washington Territory.—Plant hispid, with grayish hairs, 1 to 3 inches high, branching from the root and spreading. Leaves 4 to 6 lines long, scarcely a line wide. Flowers in short terminal leafy racemes, sessile. Calyx cleft to the middle; the short tube somewhat 5-angled; lobes linear-lanceolate, erect, densely clothed with long erect hairs; the upper portion of the tube opaque and deciduous; the lower somewhat hyaline, obtusely 5-toothed, corresponding with 5 notches in the base of the deciduous portion. Corolla a little longer than the calyx.

PLATE 12, B. PIPTOCALYX CIRCUMSCISSUS: an entire plant. Fig. 1. A flower, enlarged. 2. Corolla laid open, showing the insertion of the stamens. 3. Calyx, showing the line of separation, magnified. 4. The same, laid open, the upper and lower portions a little separated, and the lower part of the style remaining. 5. Mature fruit, magnified; as are all the following. 6. The same, with all the nutlets but one removed. 7. Inside view of one of the nutlets. 8. Transverse section of the same. 9. Seed. 10. Embryo separated from the same. The details more or less magnified.

8. ERITRICHIMUM, *Schrader*.1. ERITRICHIMUM LEUCOPHÆUM, *Alph. DC.*

*Eritrichium leucophæum*, Alph. DC. Prodr. 10, p. 129.

*Myosotis leucophæa*, Dougl.; Lehm. in Hook. Fl. Bor.-Am. 2, p. 82, t. 163.

HAB. On the Walla-Walla River, Washington Territory.—A rare and well-characterized species, easily distinguished by its acute, shining, perfectly smooth nutlets, which are flat on the back; one or more of them frequently abortive.

## 2. ERITRICHIMUM GLOMERATUM, DC.

*Eritrichium glomeratum*, DC. Prodr. 10, p. 131; Torr. Bot. Mex. Bound. p. 140.

*Myosotis glomerata*, Nutt. Gen. 1, p. 112; Hook. Fl. Bor.-Am. 2, p. 82, t. 162.

*Cynoglossum glomeratum*, Pursh, Fl. 2, p. 729.

HAB. Interior of Oregon and Washington Territory; eastward to the Great Bend of the Missouri, and southward along the mountains to New Mexico.—The southern plant has the fruit more depressed, and the carpels shorter in proportion to the breadth. It may prove to be a distinct species.

## 3. ERITRICHIMUM PTEROCARYUM, Torr. (Tab. 13, B.)

*E. annuum*; caule pilis adpressis canescente erecto basi simplici; foliis spathulato-linearibus hispidis; racemis terminalibus plerumque bifidis ebracteatis vel remote bracteatis; floribus sessilibus; calycis laciniis ovatis acutis hispidis; corolla parvula caduca, lobis obovatis emarginato-obtusis; nuculis margine alato supra medium dentato cinctis, dorso scabro planiusculo.

*E. pterocaryum*, Torr. Bot. Mex. Bound. p. 142.

HAB. Walla-Walla River, Washington Territory. Also found by Dr. Bigelow and Mr. C. Wright in New Mexico, near the Rio Grande.—Plant about a span high, erect, branching from near the base, clothed with short grayish hairs, which are mostly tuberculate at the base. Leaves half an inch to an inch long, and one or two lines wide, obtuse. Racemes scorpioid, densely flowered. Flowers very small. Calyx hispid; the lobes linear-lanceolate, erect, and somewhat elongated in fruit. Corolla apparently white, with a narrow tube, furnished at the throat with five minute protuberances which alternate with the stamens. Anthers nearly sessile, oblong, obtuse. Fruit consisting of four nutlets, one of which is usually apterous, the other strongly winged; the wings being as broad as the body, radiatingly striate and crenately toothed on the margin.



There are several other species of this genus with heteromorphous nutlets, but none in which the difference in form is so great as in this. In our New Mexican specimens the nutlets are often all winged.

PLATE 13, B. *ERITRICHIMUM PTEROCARYUM*: an entire plant. Fig. 1. Flower, enlarged. 2. Corolla, laid open and magnified. 3. Fruit, enlarged. 4. Wingless nutlet; back view. 5. Inside view of the same. 6. One of the winged nutlets, back view. 7. Face of the same. 8. Transverse section of a winged carpel. 9. Axis and style. 10. Seed. 11. Embryo.

4. *ERITRICHIMUM MURICULATUM*, *Alph. DC.* (Tab. 13, A.)

*Eritrichium?* *muriculatum*, Alph. DC. in Prodr. 10, p. 132?

*Myosotis muricata*, Lehm. in Hook. & Arn. Bot. Beech. p. 369?

HAB. Nisqually, Washington Territory.—The fruit of this plant differs from the description of Hooker & Arnott in the nutlets being rather acute, and not densely, but sparsely muriculate. Between the little prominences the surface is scabrous, with exceedingly minute and crowded elevated dots. They are about two-thirds the length of the fructiferous, and are dark gray, mottled with brown. Very often all but one are abortive. Nearly allied to *E. angustifolium* (Torr. in Pacif. R. Road Expl. 5, p. 363). In that species the stem is branched from the base, the lobes of the calyx are much narrower and longer, connivent in fruit; the fruit extremely minute, and the roughness of the surface only perceptible by the aid of a pretty strong lens. Another allied species is *E. pusillum*, but that is much smaller, the lobes of the calyx ovate, and but little longer than the fruit; the nutlets are triangular-ovate, and nearly as broad at the base as they are long, somewhat acuminate, roughened with conspicuous little white warts on the gibbous back, incurved or hollowed on the face. The four nutlets are closely approximated into a depressed, somewhat quadrangular fruit.

PLATE 13, A. ERITRICHIMUM MURICULATUM: the entire plant. Fig. 1. A flower, enlarged. 2. Corolla, laid open and magnified. 3. Ovary and style. 4. Fruit; one of the nutlets removed to show the style. 5. A back view of one of the nutlets. 6. Face of the same. 7. Seed. 8. Face of the same. 9. Embryo.

5. ERITRICHIMUM CALIFORNICUM, DC.

*Eritrichium Californicum*, DC. Prodr. 10, p. 130; Torr. Bot. Whipl. l. c. p. 124.

*E. Scouleri*, Alph. DC. in Prodr. l. c.

*Myosotis Californica*, Fisch. & Mey. Ind. Sem. H. Petrop. 1835, p. 42.

*M. Chorisiana*, Hook. & Arn. Bot. Beech. p. 152; Hook. Fl. Bor.-Am. 2, p. 83; non Cham. & Schlect.

HAB. Moist places, Bay of San Francisco, and interior of Washington Territory.

6. ERITRICHIMUM FULVUM, Alph. DC.

*Eritrichium fulvum*, Alph. DC. Prodr. 10, p. 132; Torr. Bot. Whipl. l. c.

*Myosotis fulva*, Hook. & Arn. Bot. Beech. p. 38; Hook. Fl. Bor.-Am. 2, p. 83.

HAB. Spokane and Kooskooskee Rivers, Washington Territory.

9. KRYNITZKIA, Fisch. & Mey.

1. KRYNITZKIA LEIOCARPA, Fisch. & Mey.

*Krynitzkia leiocarpa*, Fisch. & Mey. Ind. Sem. H. Petrop. 1841, p. 52; DC. Prodr. 10, p. 135; Torr. Bot. Whipl. Rep. p. 124.

*Myosotis flaccida*, Dougl. in Hook. Fl. Bor.-Am. 2, p. 42.

HAB. Columbia River; between the mouth of the Spokane and Colville; frequent also in California, and as far south as the Colorado River.

## 10. PECTOCARYA, DC.

## 1. PECTOCARYA LATERIFLORA, DC.

*Pectocarya lateriflora*, DC. Prodr. 10, p. 120.

*Cynoglossum pilosum*, Ruiz & Pav. Fl. Peruv. 2, p. 6, t. 3, f. 6.

HAB. Near Fort Okanagan and other trading forts on the Upper Columbia; probably introduced by cattle from farther south, or perhaps from Peru.—The characters assigned to the four species of *Pectocarya*, described in the Prodrômus, are not reliable, and we strongly doubt whether there is more than one species of that genus. Our Okanagan plant is intermediate between *P. lateriflora* and *P. Chilensis*. *P. penicillata* usually has the nutlets pectinate chiefly on the upper half; but, frequently, with the exception of a short naked interval, the lower half is pectinate also. Nuttall's *Cynoglossum pilosum* (*C. Nuttallii*, Spreng.), which Alph. DeCandolle referred to *P. penicillata*, is a species of *Echinosperrnum*. In our specimens of *Pect. penicillata* the margin of the nutlets is pectinate with uncinatè (not glochidiatè) hairs, as in the other species. In the Prodrômus (in a note) there is an error, which is probably accidental, as to the direction of the radicle of *Pectocarya*. It is *inferior* in all the specimens that we have examined.

## 11. ECHINOSPERMUM, Swartz.

## 1. ECHINOSPERMUM PATULUM, Lehm.

*Echinosperrnum patulum*, Lehm. Asperif. p. 124; Hook. Fl. Bor.-Am. 1, p. 84; DC. Prodr. 10, p. 137; Torr. Bot. Mex. Bound. p. 142.

HAB. Upper Columbia, Washington Territory.—This species is pretty widely diffused over the country west of the Mississippi. It occurs as far south as Eagle Pass on the Rio Grande. No. 634 of Fendler's and 1569 of Wright's New Mexican collections are the same as the plant of the Exploring Expedition. The Rev. Mr. Spalding collected on the Kooskooskee a variety of this species in which the prickles of the nutlets are shorter, and tapering from a broad base.

2. ECHINOSPERMUM FLORIBUNDUM, *Lehm.*

*Echinosperrum floribundum*, Lehm. Pug. 2, p. 24; Hook. Fl. Bor.-Am. 2, p. 54, t. 164; DC. Prodr. 10, p. 143.

HAB. Upper Columbia, Washington Territory; in various places.—This is placed among the doubtful species of *Echinosperrum* by De Candolle, who appears to have overlooked the full description and excellent figure of Hooker, l. c. It seems to be most nearly related to *E. brachycentrum* of Ledebour. The nutlets are somewhat heteromorphous; two opposite ones having a wider margin than the other two. Our plant is the same as No. 633 of Fendler's New Mexican collection.

## O R D. 57. HYDROPHYLLACEÆ.

1. HYDROPHYLLUM, *Tourn.*1. HYDROPHYLLUM VIRGINICUM, *Linn.*

HAB. Oregon and Washington Territory.—This differs from the eastern plant only in the smaller flowers, and in the filaments being much less hairy near the middle.

2. HYDROPHYLLUM CAPITATUM, *Dougl.*

HAB. Spipen River, Washington Territory; in moist places.—The root consists of long thick fasciculate fibres which abound in starch.

2. NEMOPHILA, *Nutt.*1. NEMOPHILA PARVIFLORA, *Benth.*

HAB. Nisqually, Puget Sound ; on exposed moist banks.—Alph. De Candolle has united *N. pedunculata* of Bentham with this species, but we think it is distinct, if we have identified Bentham's plant. See the Botany of Whipple's Pacific Railroad Report, p. 142. Specimens of what we take to be a form of *N. parviflora* were collected at the entrance to Puget Sound by Dr. Pickering. They differ in their much larger and thinner leaves and more lax habit, and so much resemble *Ellisia microcalyx* of Nuttall (which Fischer and Meyer have properly removed to *Nemophila*) that it is difficult to distinguish them. The appendages of the calyx in each are very small, and might easily be overlooked without close inspection.

3. PHACELIA, *Juss.*

## 1. PHACELIA (EUTOCA) MENZIESII.

*Eutoca Menziesii*, R. Br. App. Frank. Narr. p. 764, t. 27, & ed. 2, p. 51 ; Hook. Fl. Bor.-Am. 2, p. 79, & Bot. Mag. t. 3762 ; Alph. DC. Prodr. 9, p. 295.  
*E. heterophylla*, Torr. in Stansbury Rep. p. 393.

HAB. Oregon and Washington Territory ; common in prairies.

2. PHACELIA CIRCINATA, *Jacq. f.*

*Phacelia circinata*, Jacq. fl. Ecl. 1, p. 135, t. 95 ; Alph. DC. Prodr. 9, p. 298.  
*P. heterophylla*, Pursh Fl. 1, p. 140 ; Hook. Fl. Bor.-Am. 2, p. 80.

HAB. Oregon, Washington Territory, and California ; southward to the Straits of Magellan.

3. PHACELIA RAMOSISSIMA, *Dougl.*

*Phacelia ramosissima*, Dougl. in Benth. in Trans. Linn. Soc. 17, p. 280; Hook. Fl. Bor.-Am. 2, p. 80; Alph. DC. Prodr. 9, p. 299.

HAB. Near Fort Okanagan on the Upper Columbia.

4. ERIODYCTION, *Benth.*1. ERIODYCTION GLUTINOSUM, *Benth.*

*Eriodyction glutinosum*, Benth. Bot. Sulph. p. 35; Choisy in DC. Prodr. 10, p. 183; Torr. Bot. Mex. Bound. p. 148.

*E. angustifolium*, Nutt. Pl. Gamb. in Jour. Acad. Phil. n. ser. 1, p. 181.

*Wigandia*? *Californica*, Hook. & Arn. Bot. Beech. p. 364, t. 88.

HAB. Mountains of Northern California, and Valley of the Sacramento; not uncommon.

## ORD. 58. POLEMONIACEÆ.

1. PHLOX, *Linn.*1. PHLOX SPECIOSA, *Pursh.*

*Phlox speciosa*, Pursh. Fl. 1, p. 149; Gray in Proc. Am. Acad. 8, p. 256.

*P. occidentalis*, Durand in Bot. Whipl. Rep. p. 125.

*P. divaricata*, Durand, Pl. Pratten. in Jour. Acad. Philad. n. ser. 1, p. 97.

Var. SABINI: *corollæ lobis obovatis basi cuneatis integerrimis vel retusis.*

*P. Sabini*, Dougl. in Hook.; Benth. in DC. Prodr. 9, p. 305.

HAB. On the Spipen River, Washington Territory.—Plant about a foot high, branching from the shrubby base. Leaves narrowly lanceolate, smoothish when old, the margin thickened. Flowers about as large as in *P. subulata*. Style shorter than the stigmas. The Var. *Sabini*: between the Cascade Mountains and the Upper Columbia; also near Fort Okanagan, Washington Territory.—A shrubby species, seldom more than a foot high, often prostrate. Leaves linear-subulate, pungent, 1 to 2½ inches long, and 1 or 2 lines wide, more or less pubescent, the axils naked and fasciculate. Flowers in small, loose, terminal cymes. Calyx usually about half as long as the tube of the corolla; the teeth narrowly lanceolate, with a long subulate point. Corolla three-fourths of an inch long, the lobes entire or emarginate. Style long and slender. Ovules solitary in each cell of the ovary. It is not possible to determine, without an examination of the original specimens of Pursh, whether this is his *P. speciosa*, but it agrees sufficiently well with his description, and we have it also from the region where those specimens were collected by Lewis. The variety *elatio*r of Hooker, of which we have specimens named by that distinguished botanist, differs in its very short style and elongated stigmas. We have it also from the hills of the Upper Sacramento, where it was collected by Fremont in 1846. *P. speciosa*, of Bentham, in DC. Prodr., differs in the cells of the ovary being binovulate.

## 2. PHLOX DOUGLASII, Hook.

*Phlox Douglasii*, Hook. Fl. Bor.-Am. 2, p. 73, t. 158; Benth. in DC. Prodr. 9, p. 306.

HAB. Base of the Cascade Mountains, on the eastern side.—Rather more densely caespitose, and the leaves shorter than in Hooker's figure, but wholly like specimens of a *Phlox* collected by Fremont in Utah, and named *P. Douglasii* by Bentham.

## 3. PHLOX CANESCENS, Torr. & Gray.

*Phlox canescens*, Torr. & Gray in Pacif. R. Road Expl. 2, p. 122, t. 6.  
*P. Hoodii*, Torr. in Stansb. Rep. p. 324.

HAB. Cascade Mountains of Washington Territory; eastern side.

2. COLLOMIA, *Nutt.*1. COLLOMIA LINEARIS, *Nutt.*

HAB. Columbia and Kooskooskee Rivers; eastward to the Upper Missouri.

2. COLLOMIA GRANDIFLORA, *Dougl.*

HAB. Columbia River and its tributaries in Oregon and Washington Territory; also around Puget Sound.

3. COLLOMIA GRACILIS, *Dougl. in Hook.*

HAB. Gray's Harbor, Puget Sound, and Upper Columbia; southward to California and New Mexico.

4. COLLOMIA LINOIDES, *Nutt.*

*Collomia linoides*, Nutt. in Jour. Acad. Philad. n. ser. 1, 159.

HAB. On the Walla-Walla River, Washington Territory.—Plant about a foot high, with numerous upright branches. Lower leaves often pinnately 3-5-parted, the divisions narrowly linear; upper stem leaves entire, narrowly linear, erect. Flowers racemose on the branches, the pedicels very short. Calyx campanulate, 5-cleft nearly to the middle, the lobes narrowly oblong, abruptly tipped with a short point. Corolla pale purple, scarcely 2 lines long, the tube slender and a little longer than the calyx, lobes of the border oblong, obtuse with a mucro. Style shorter than the tube of the corolla, the extremity 3-cleft. Ovary with a single ovule in each cell. I have not seen Nuttall's specimens of his *C. linoides*, but our plant seems to be the same as a *Collomia* found by Fremont in his second journey; probably somewhere in the Rocky Mountains. [This is *Gilia minutiflora*, Benth. in DC. Prodr., and is referred to that genus in the revision of *Polemoniaceæ* by A. Gray.]



3. NAVARRETIA, *Ruiz & Pav.*1. NAVARRETIA INTERTEXTA, *Hook.*

*Navarretia intertexta*, Hook. Fl. Bor.-Am. 2, p. 75; Benth. in DC. Prodr. 9, p. 309.

HAB. Fort Colville and Spokane River, Washington Territory.—The specimens are all unbranched, and not more than three or four inches high. The cells of the ovary 3-ovuled.

2. NAVARRETIA SQUARROSA, *Hook. & Arn.*

*Navarretia squarrosa*, Hook. & Arn. Bot. Beechey, p. 368; Benth. in DC. Prodr. 9, p. 910.

HAB. Near San Francisco, California; a dwarf prostrate form, probably resulting from injury.

3. NAVARRETIA HETEROPHYLLA, *Benth.*

*Navarretia heterophylla*, Benth. in DC. Prodr. 9, p. 309.

*Collomia heterophylla*, Dougl. in Hook. Bot. Mag. t. 2895; Lindl. Bot. Reg. t. 1347.

HAB. Oregon and Washington Territory; common; southward to California.—Extremely variable in the foliage; the extreme forms being so different that they seem hardly to belong to the same species. The leaves in some specimens are entire, and in others bipinnately divided.

4. GILIA, *Ruiz & Pav.*1. GILIA CONGESTA, *Hook.*

*Gilia congesta*, Hook. Fl. Bor.-Am. 2, p. 75; & Ic. Pl. t. 235; Benth. in DC. Prodr. 9, p. 311.

HAB. Between the mouth of Spokane River and Fort Colville, Washington Territory; also on the Klamath, Northern California.—This species is annual, or perhaps biennial; not perennial, as stated by Bentham.

2. *GILIA INCONSPICUA*, *Dougl.*

*Gilia inconspicua*, Dougl. in Bot. Mag. 2883; Hook. Fl. Bor.-Am. 2, p. 74; Benth. in DC. Prodr. 9, p. 312.

HAB. On the Walla-Walla River; a common species in Oregon and California.

3. *GILIA AGGREGATA*, *Spreng.*

*Gilia aggregata*, Spreng. Syst. 1, p. 626; Sweet, Brit. Fl. Gard. n. ser. 3, t. 218; Torr. Bot. Mex. Bound. p. 146.

*G. pulchella*, Dougl. in Hook. Fl. Bor.-Am. 2, p. 74; Hook. & Arn. Bot. Beechey, p. 366; Benth. in DC. Prodr. 9, p. 313.

*Cantua aggregata*, Pursh, Fl. 1, p. 147.

*Ipomeria aggregata*, Nutt. Gen. 1, p. 124.

*Ipomopsis elegans*, Lindl. Bot. Reg. t. 1281.

HAB. Interior of Washington Territory and Oregon; also on the Upper Missouri, and southward to New Mexico.

4. *GILIA PHARNACEOIDES*, *Benth.*

*Gilia pharnaceoides*, Benth. in Bot. Reg. sub t. 1622; & in DC. Prodr. 9, p. 315; Hook. Fl. Bor.-Am. 2, p. 74; t. 161.

HAB. Puget Sound and Upper Columbia; southward to California.

5. *GILIA TENELLA*, *Benth.*

HAB. Port Discovery, and vicinity of Nisqually, Washington Territory; its most northern station known. [This was referred to *G. micrantha*, but the species has since been distinguished.]

6. *GILIA PUNGENS*, *Benth.*

*Gilia pungens* & *G. Hookeri*, Benth. in DC. Prodr. 9, p. 316.

*Cantua pungens*, Torr. Ann. Lyc. N. York, 2, p. 220.

*Phlox Hookeri*, Dougl. in Hook. Fl. Bor.-Am. 2, p. 73, t. 159.

HAB. Upper Columbia, Washington Territory.—The original scanty specimen of *Cantua pungens*, collected on Long's expedition to the Rocky Mountains, is sufficient to show that it is identical with *Phlox Hookeri* of Douglas, and, consequently, *Gilia Hookeri* of Benth. Like *P. Californica*, it is shrubby, as stated by Hooker and Arnott, and not herbaceous, as recorded in the Prodr. According to Dr. Pickering's notes, this species in favorable situations grows a foot or two high, and forms thickets, which are almost impenetrable from the rigid branches and pungent leaves.

5. *POLEMONIUM*, *Linn.*1. *POLEMONIUM CÆRULEUM*, *Linn.*

HAB. Between the Spokane and the Kooskooskee Rivers.—Plant from two to four feet high.

2. *POLEMONIUM HUMILE*, *Willd.*

HAB. Eastern base of the Cascade Mountains, Washington Territory.—Plant 4 to 6 inches high. [This, the *P. pulcherrimum* of Hooker, with its allied forms, was referred to the preceding species. Had the manuscript been revised by the author, it would probably have been distinguished as above, and other changes made in conformity with the Revision of North American Polemoniaceæ, in Proc. Am. Acad., referred to above.]

## ORD. 59. CONVULVACEÆ.

### 1. CALYSTEGIA, *R. Br.*

#### 1. CALYSTEGIA SEPIUM, *R. Br.*

HAB. Valley of the Sacramento, and near San Francisco, California; apparently indigenous.

#### 2. CALYSTEGIA SOLDANELLA, *R. Br.*

HAB. Sandy beaches, Puget Sound, and near Gray's Harbor, Washington Territory; southward along the coast of California.

### 2. CRESSA, *Linn.*

#### 1. CRESSA CRETICA, *Linn.*, Var. TRUXILLENSIS, *Choisy, in DC.*

HAB. Base of hills on the Lower Sacramento, California; its most northern station hitherto recorded.

### 3. CUSCUTA, *Turn.*

[The MSS. of the species of *Cuscuta* of this collection had not been prepared. The species are comprised in Dr. Engelmann's monograph of the genus, in the Transactions of the St. Louis Academy of Science.]

## O<sub>R</sub>D. 60. SOLANACEÆ.

### 1. SOLANUM, *Linn.*

#### 1. SOLANUM UMBELLIFERUM, *Esch*

*Solanum umbelliferum*, Eschscholtz, in Mem. St. Petersburg. 10, p. 220; Torr. Bot.

Whipl. Rep. l. c. p. 127, & Bot. Mex. Bound. p. 151.

*S. Californicum*, *S. genistoides*, & *S. Menziesii*, Dunal, in DC. Prodr.

HAB. Near San Francisco, California.—Suffrutescent, 3 feet high, with upright rigid branches. Leaves scarcely an inch long, ovate, entire, densely pubescent on both sides. Flowers in small terminal clusters, deep blue, about half an inch in diameter. Fruit very deep purple, the size of an ordinary cherry.

#### 2. SOLANUM NIGRUM, *Linn.*

HAB. Bay of San Francisco, California; probably brought from farther south.

### 2. NICOTIANA, *Linn.*

#### 1. NICOTIANA QUADRIVALVIS, *Pursh.*

*Nicotiana quadrivalvis*, Pursh, Fl. 1, p. 141; Nutt. Gen. 1, p. 132; Hook. Fl.

Bor.-Am. 2, p. 91; Dunal, in DC. Prodr. 13, part 1, p. 571.

HAB. Near Santa Clara, California, where it is abundant and apparently indigenous. This species is cultivated by the aborigines, from Western Kansas to the Pacific. Nuttall says that he nowhere found it growing spontaneously.

2. NICOTIANA MULTIVALVIS, *Lindl.*

*Nicotiana multivalvis*, Lindl. Bot. Reg. t. 1057; Hook. l. c.; Dunal in DC. l. c.

HAB. Sandy plains of the Umpqua River, Northern California; perhaps only a variety of *N. quadrivalvis*.—In our specimens the capsule is only 5-celled.

## ORD. 61. GENTIANACEÆ.

1. FRASERA, *Walt.*1. FRASERA ALBICAULIS, *Hook.*

*Frasera albicaulis*, Griseb. Gent. p. 330; Hook. Fl. Bor.-Am. 2, p. 69, t. 154, & in DC. Prodr. 9, p. 131.

*F. nitida*, Benth. Pl. Hartw. p. 322; Torr. Bot. Whipl. l. c. p. 126.

HAB. On the Spokane River, Washington Territory; southward to California.

2. FRASERA THYRSIFLORA, *Hook.*

*F. caule erecto simplici elato glabro; foliis ternatim verticillatis oblongo-lanceolatis; panicula densiflora elongata; calycis segmentis lanceolato-linearibus; foveis solitariis transverse oblongo-orbiculatis prope basim corollæ loborum; corona nulla.*

*Frasera Carolinensis*, Griseb. in Hook. Fl. Bor.-Am. 2, p. 66, excl. syn.

*F. thyrsiflora*, Hook. in Jour. Bot. & Kew. Misc. 3, p. 288.

HAB. On the Kooskooskee River, in rich prairies; rare.—Stem 3 to 5 feet high, stout. Radical leaves wanting. Lower stem-leaves 5 or 6 inches long, and an inch or more broad, acute, upper ones gradually smaller. Panicle, or rather compound cyme, contracted, 3 or 4 inches long, many-flowered, the flowers smaller than in *F. Carolinensis*: corolla apparently greenish-white. Stamens half the length of the corolla: anthers broadly ovate. Capsule much compressed, ovate, acute. Seeds 10 to 15, flat, winged.

This species, although much resembling *F. Carolinensis*, seems to be quite distinct. In the latter the paniculate cymes are loosely flowered; the ciliate glands or foveæ are orbicular-obovate, and seated almost in the middle of the division of the corolla, and the anthers are narrowly oblong. The species of this collection was distinguished and described as above before it was noticed that Sir William Hooker had characterized it from Geyer's collection. According to Geyer the corolla is "litmus-blue."

## 2. GENTIANA, *Tourn.*

### 1. GENTIANA SCEPTRUM, *Griseb.*

*Gentiana sceptrum*, Griseb. Gent. p. 293, & in Hook. Fl. Bor.-Am. 2, p. 57, t. 145, & in DC. Prodr. 9, p. 115.

HAB. Near the Umpqua River, Oregon; in marshes.—Stem erect, straight, 3 feet high, perfectly smooth. Leaves 2 to 2½ inches long, and 6 or 7 lines wide, a little narrowed at the base. Flowers few, in terminal and axillary clusters. Lobes of the calyx spatulate-lanceolate, as long as the tube. Corolla 1½ inches long, tubular-inflated; the lobes ovate, obtuse: plicæ, or appendages, almost wanting, one-toothed. Capsule at length somewhat exserted. Seeds wingless.

### 2. GENTIANA CALYCOSA, *Griseb.*

*Gentiana calycosa*, Griseb. Gent. p. 292, & in Hook. Fl. Bor.-Am. 2, p. 58, t. 146, & in DC. Prodr. 9, p. 115.

HAB. Between the Spokane and the Kooskooskee Rivers, Washington Territory.—Specimens without flowers.

3. GENTIANA AFFINIS, *Griseb.*

*Gentiana affinis*, Griseb. Gent. p. 289, & in Hook. Fl. Bor.-Am. 2, p. 56; & in DC. Prodr. 9, p. 114.

HAB. In moist places on the Cascade Mountains, Washington Territory.

4. GENTIANA ACUTA, *Michx.*? Var.

*Gentiana acuta*, Michx. Fl. 1, p. 114.

HAB. Mountains of Northern California; in wet places.—Plant about a span high, more or less branched, slender. Inflorescence loose and somewhat racemose; the flowers mostly solitary, and on pedicels 5 to 10 lines long. Calyx 5-parted almost to the base, sometimes scarcely half the length of the tube of the corolla, but more commonly nearly equalling it. Corolla "cream color, with a blue tint," about 8 lines long, 5-lobed; the lobes less than half the length of the tube, oblong, obtuse, entire, covered with about 12 slender subulate processes, arising from near the base of the lobe. Stamens 5; with no glands at the base of the filaments. Capsule oblong-linear, conspicuously stipitate, at length partly exserted. Seeds orbicular, much compressed, wingless.

3. MENYANTHES, *Tourn.*1. MENYANTHES TRIFOLIATA, *Linn.*

HAB. Upper Columbia, Washington Territory, and southward to San Francisco.—Resembling in all respects the plant of the Eastern States and of Europe.



2. MENYANTHES PUMILA, *Dougl. MSS.*

*Villarsia pumila*, Griseb. Gent. p. 388. & in Hook. Fl. Bor.-Am. 2, p. 70, t. 157, B.

HAB. Upper Columbia and its tributaries, Washington Territory.—Grisebach (l. c.) states that he could not determine the position of the ovules, and there was no fruit in the specimens which he examined, so that he was uncertain whether the plant was really a *Villarsia* or a species of *Menyanthes*. Our specimens afford the fruit in perfection, and there can be no doubt that the placentæ are in the middle of the valves; so that the plant cannot be a *Villarsia*. The valves, too, remain entire when the capsule is quite old, and has discharged its seeds. In the position of the placentæ this species resembles *Menyanthes*, but it differs greatly in habit, and in the seeds being reticulate-pitted. In some of our specimens several of the capsules were tri-carpellary.

[Referred rightly by Porter (Hayden's Rep., 1872) to the genus *HESPEROCHIRON*, Watson in King's Reports, 5, p. 281. *H. Californicus*, Watson, l. c., t. 30, is probably but a form of this.]

## O R D. 62. ASCLEPIADACEÆ.

1. ASCLEPIAS, *Linn.*1. ASCLEPIAS SPECIOSA, *Torr.*

*Asclepias speciosa*, Torr. in Ann. Lyc. N. York, 2, p. 218.

*A. Douglasii*, Hook. Fl. Bor.-Am. 2, p. 53, t. 142; Decaisne in DC. Prodr. 8, p. 564.

HAB. Upper Columbia River and southward to the Valley of the Sacramento.—In the California specimens the leaves are thicker,

more obtuse, and more tomentose. The fruit (which has hitherto not been described) is much like that of *A. cornuti*, being ovate-oblong, bluntly acuminate, and covered with soft subulate processes.

2. ASCLEPIAS FASCICULARIS, *Decaisne*.

*Asclepias fascicularis*, Decaisne in DC. Prodr. 8, p. 569.

*A. macrophylla*, Nutt. Pl. Gamb. in Jour. Acad. Philad. (n. ser.) 1, p. 180.

HAB. On the Willamette River, Oregon, and along the Sacramento, California.

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ORD. 63. A P O C Y N A C E Æ.

1. A P O C Y N U M, *Tourn.*

1. APOCYNUM ANDROSÆMIFOLIUM, *Linn.*

HAB. On the Columbia, and its tributaries in Washington Territory and Oregon; southward to the Valley of the Sacramento.

2. APOCYNUM CANNABINUM, *Linn.*

HAB. Washington Territory to San Francisco, California.—Both species extend over the whole breadth of the continent.

## ORD. 64. OLEACEÆ.

### 1. FRAXINUS, *Tourn.*

#### 1. FRAXINA OREGANA, *Nutt.*

*Fraxinus Oregana*, Nutt. Sylv. 3, p. 59, t. 99; Torr. Pl. Whipl. 1. c. p. 128.

*F. pubescens*, var., Hook. Fl. Bor.-Am. 2, p. 51.

*F. grandifolia*, Benth. Bot. Sulph. p. 33.

HAB. Puget Sound to the Upper Sacramento, California. On the Lower Sacramento, a variety (*glabrescens*); the leaflets four pairs, oval, rather obtuse, entire or slightly serrate, glabrous above, and almost so beneath.

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## ORD. 65. ARISTOLOCHIAEÆ.

### 1. ARISTOLOCHIA, *Tourn.*

#### 1. ARISTOLOCHIA CALIFORNICA, *Torr.*

*Aristolochia Californica*, Torr. in Pacif. Railroad Expl. (Bot. Whipl.) 4, p. 128.

HAB. On the Sacramento River, California.—The specimens are without flowers and fruit, but there can be no doubt of the species.

They were overlooked when I was describing the plant in the work just quoted. Before receiving the flowers from Dr. Bigelow and Dr. Hulse, I supposed the plant might be a variety of *A. tomentosa*, which, in foliage, it greatly resembles.

2. ASARUM, *Tourn.*

1. ASARUM CAUDATUM, *Lindl.*

*Asarum caudatum*, Lindl. Bot. Reg. t. 1399.

*A. Hookeri*, Fielding, Sert. Plant, fol. & tab. 32; Torr. l. c.

*A. Canadense*, var., Hook. Fl. Bor.-Am. 2, p. 139.

HAB. Oregon and California.—All our specimens have the long attenuated lobes of the corolla, and I have seen no forms intermediate between this species and *A. Canadense*. It is also taller and more disposed to branch than the eastern plant, but the root has the same warm aromatic taste. It is, however, bitter.

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ORD. 66. NYCTAGINACEÆ.

1. ABRONIA, *Juss.*

1. ABRONIA MELLIFERA, *Dougl. in Hook.*

*Abronia mellifera*, Dougl. in Hook. Bot. Mag. t. 2879; Choisy in DC. Prodr. 13, 2, p. 435; Torr. in Bot. Whipl., excl. var. *nana*.

HAB. Banks of the Walla-Walla River, Oregon.—In revising the species of *Abronia*, I am led to the conclusion that *A. mellifera* of the Botany of the Mexican Boundary Survey embraces two distinct spe-

cies. The plant of the Rio Grande Valley differs from that of California and Oregon in the wings of the fruit being truncate and inflated at the summit, while downward they become gradually narrower to the base of the calyx-tube. I propose to call this species *A. turbinata*.

2. *ABRONIA ARENARIA*, *Menzies in Hook. l. c.*

HAB. On the strand of Gray's Harbor and Dungeness, Washington Territory; abundant also around San Francisco, forming patches on the shore 2 to 3 feet in diameter, producing its orange-yellow flowers all the season. The fruit is mostly 5-winged; the wings rigid, broadest and obtusely angular a little above the middle, and narrowed at both extremities.

*A. umbellata*, the other of the two sea-shore species, with pink-purple blossoms, appears not to have been collected.

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ORD. 67. CHENOPODIACEÆ.

1. CHENOPODIUM, *Linn.*

1. CHENOPODIUM ALBUM, *Linn.*

HAB. Shores of Puget Sound; also on the Upper Columbia and on the Lower Sacramento. Doubtless of European origin.

2. BLITUM, *Tourn.*1. BLITUM RUBRUM, *Linn.?*

HAB. Bay of San Francisco, California; the specimens insufficient for proper determination. [It is *Blitum Californicum*, S. Watson, yet unpublished.]

3. ATRIPLEX, *Tourn.*1. ATRIPLEX HASTATA, *Linn.*2. ATRIPLEX LITTORALIS, *Linn.*

HAB. The first in California, on the shores of the Bay of San Francisco; the second at Gray's Harbor, Washington Territory.

4. OBIONE, *Gært.*1. OBIONE LEUCOPHYLLA, *Moquin.*

HAB. California, in the vicinity of San Francisco.

[Two other species are indicated, but not determined: one from Spokane River, Washington Territory, without flowers or fruit; the other from the Bay of San Francisco. No specimens are found in Dr. Torrey's herbarium.]

5. GRAYIA, *Hook. & Arn.*1. GRAYIA POLYGALOIDES, *Hook. & Arn.*

*Grayia polygaloides*, Hook. & Arn. Bot. Beech. Voy. p. 338; Hook. Ic. t. 271.

*G. spinosa*, Moq. in DC. Prodr. 13, part. 2, p. 110.

*Chenopodium? spinosum*, Hook. Fl. Bor.-Am. 2, p. 127 (mas).

HAB. On the Walla-Walla and Upper Columbia, as far north as Spokane River; sometimes attaining the height of six feet.

6. EUROTIA, *Adans.*1. EUROTIA CERATOIDES, *C. A. Meyer.*

HAB. On the Walla-Walla River, and through the interior of Oregon, &c.

7. CORISPERMUM, *Linn.*1. CORISPERMUM HYSSOPIFOLIUM, *Linn.*

HAB. On the Walla-Walla River, Oregon, and through the interior.—Variable in the form and length of the bracts, as well as in the inflorescence.

8. SALICORNIA, *Tourn.*1. SALICORNIA AMBIGUA, *Michx.*

HAB. Shores of the Bay of San Francisco, and at Nisqually, Washington Territory.—We have not the means of comparing our plant with *S. radicans* of Europe. It is certainly the same as Hooker's *Salicornia radicans*, of which we have authentic specimens collected at the Straits of De Fuca by Dr. Scouler. It is common on the Atlantic coast of the United States, from Maine to Florida, and it always seems to keep distinct from *S. herbacea*.

9. SUÆDA, *Forsk.*1. SUÆDA MARITIMA, *Dumort.*

HAB. Saline soil on the Lower Sacramento, California. [No annual species is otherwise known from this region, and the specimens, unfortunately, are not preserved in the Torrey herbarium.]

2. *SUÆDA FRUTICOSA*, *Forsk.*

HAB. Shores of San Francisco Bay.—A stout, densely-leaved form, of which we have specimens from Chihuahua and other parts of Mexico. A more slender variety, with shorter and narrower leaves, occurs on the Lower Sacramento. This, as the seeds are much more commonly horizontal than vertical, may be *S. dendroides*, Moq. Chenop., which, again, is probably not distinct from *S. fruticosa*. [The shrubby *Suæda* of the Bay of San Francisco is now determined by S. Watson to be distinct, both from the foreign *S. fruticosa*, and from the Mexican plant referred to.]

10. *SARCOBATUS*, *Nees.*1. *SARCOBATUS VERMICULARIS*, *Torr.*

*Sarcobatus vermicularis*, Torr. in Emory's Rep. p. 149.

*S. Maximiliani*, Nees, in App. Maximil. Trav. (ed. Angl.) p. 518; Seubert in Bot. Zeit. 1844, p. 753, t. 7.

*Fremontia vermicularis*, Torr. in Frem. 1st Rep. p. 95; & in 2d Rep. p. 317, t. 3.

*Batis?* *vermiculatus*, Hook. Fl. Bor.-Amer. 2, p. 128.

HAB. Interior of Oregon and Washington Territory.—It is remarkable that this well-characterized Chenopodiaceous plant (which is the Pulpy Thorn of Lewis & Clark), should have been doubtfully referred by Nees to *Urticaceæ*, and a suspicion expressed by that acute botanist that it might belong to *Euphorbiaceæ*. The female flowers are often overlooked, being very small, and partly concealed in the axils of the leaves.



## ORD. 68. AMARANTACEÆ.

### 1. AMARANTUS, *Linn.*

#### 1. AMARANTUS ALBUS, *Linn.*

HAB. Around settlements on the Walla-Walla, Washington Territory; introduced from Central America.

### 2. NITROPHILA, *S. Watson.*

#### 1. NITROPHILA OCCIDENTALIS, *S. Watson.*

*Banalia?* (*Idiopsis*) *occidentalis*, Moquin in DC. Prodr. 13, 1, p. 279.

*Nitrophila occidentalis*, S. Watson, Bot. C. King, Explor. 40th par. p. 297.

HAB. Saline plains at the base of hills on the Lower Sacramento, California.—Plant 4 to 6 inches high, branching from a perennial base; the branches erect. Leaves about half an inch long, and half a line wide, slightly connate at the base. Flowers a line and a half long, with two foliaceous bracteoles next the axis. Sepals oblong-lanceolate, acute, whitish, chartaceous, smooth. Stamens two-thirds the length of the sepals: filaments subulate from a broad base, where they are slightly connate: anthers obtuse, 2-lobed at the base. Utricle nearly as long as the persistent sepals, acuminate, chartaceous. Seed black and shining; the albumen copious: cotyledons linear.

This genus is nearly related to *Polycnemon* and *Hemichroa*; and has also a strong resemblance to *Halimocnemis* of *Chenopodiaceæ*, of which it was considered a species by Nuttall. We think, however, that it belongs to *Amaranthaceæ*, and that it is distinct from *Banalia*, as was suspected by Moquin.

[Dr. Torrey had characterized this as a new genus; but, as it has now already been published by Mr. Watson, as above, the name and technical character given by the former become superfluous.]

## ORD. 69. POLYGONACEÆ.

### 1. ERIOGONUM, *Michx.*\*

#### 1. ERIOGONUM SPHÆROCEPHALUM, *Dougl. in Benth.*

HAB. Spiken River, Washington Territory.—A diffusely branched little shrub, seldom rising more than 6 inches above the ground. Leaves three-fourths of an inch long, and about 2 lines wide. Head of flowers three-fourths of an inch in diameter. Tube of the perianth attenuate below and into a short stalk which is articulated to the pedicel.

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\* A monograph of this genus, and the tribe it mainly represents, was published in the year 1870, in the Proceedings of the American Academy of Arts and Sciences, vol. 8, pp. 145–200, under the title of *A Revision of the Eriogoneæ*, by John Torrey and Asa Gray. And the new species of the present collection had also been communicated to Mr. Bentham long before, and published in the fourteenth volume of De Candolle's *Prodromus*. Accordingly no characters are given in the present enumeration, and the synonymy is omitted as now superfluous. One or two points of difference between the Revision and the present account (which it is not worth while to harmonize) are explained by the fact that, while this account was prepared several years ago by Dr. Torrey, the Revision was wholly written by his associate.

2. *ERIOGONUM THYMOIDES*, *Benth. in DC.*

HAB. Upper Columbia and its tributaries, Washington Territory.—Stem prostrate, tortuous, and woolly; very much branched. Leaves very small and crowded, hoary-tomentose, appearing somewhat terete from revolute margins, which extend almost to the midrib. Flowering branches elongated, leafless, or bearing a fascicle of leaves near the middle. Head of flowers half an inch in diameter. Perianth dark-red, densely clothed with white woolly hairs, which are reflexed towards the base; the 3 exterior divisions orbicular, cordate at the base; the inner ones broadly obovate, and a little smaller. Pedicels articulated to the attenuated base of the flower. This species is certainly, as Benthham remarks, very near *E. andinum*, Nutt., and may not be distinct.

3. *ERIOGONUM OVALIFOLIUM*, *Nutt.*

HAB. Valley of Klamath River, borders of Northern California; in dry prairies.—The flowers vary from nearly white and pale yellow to dull purplish-red, and the species evidently includes *E. purpureum*, Nutt., Benth. (*Eucycla*, Nutt.), as a mere variation.

4. *ERIOGONUM ANGUSTIFOLIUM*, *Nutt., Benth. in DC.*

HAB. On the Spipen and Yakima Rivers, between the Cascade Mountains and the Upper Columbia; a rare species.

5. *ERIOGONUM COMPOSITUM*, *Dougl. in Benth.*

HAB. Eastern base of the Cascade Mountains to the Upper Columbia; also on the Kooskooskee.—Peduncles 12 to 18 inches long. Perianth yellow, smooth and shining, attenuated at the base to a short stalk, which is articulated to the pedicel. Achenium pubescent near the summit. Embryo nearly straight.

6. *ERIOGONUM POLYANTHUM*, *Benth. in DC.* (Tab. 14, B.)

HAB. Headwaters of the Sacramento, Northern California, where it was found also by Col. Fremont and Dr. Newberry.—Plant woody and decumbent at the base, the branches assurgent, 12 to 18 inches high. Umbel of 4 to 7 simple rays. Perianth yellow, much enlarged after flowering.

PLATE 14, B. *ERIOGONUM POLYANTHUM*: the entire plant (except the prostrate stem) of the natural size. Fig. 1. A head of flowers; the involucre laid open longitudinally. 2. The involucre and persistent pedicels, after the flowers have fallen. 3. Upper part of the involucre laid open. 4. A separate flower, with its pedicel and bracteole. 5. One of the inner divisions of the perianth, with three stamens inserted near its base. 6. A stamen. 7. Achenium and persistent styles. 8. A seed. 9. The same longitudinally divided. 10. Transverse section of the same. 11. Embryo, all the details more or less magnified.

7. *ERIOGONUM LATIFOLIUM*, *Smith.*

HAB. California, in the vicinity of San Francisco; including *E. oblongifolium*, Benth., as a less robust variety, with leaves inclined to be acute at base. [The var. ? *minus*, Benth., from Spokane River, Washington Territory is probably of some other species, but the specimen is insufficient for determination.]

8. *ERIOGONUM AFFINE*, *Benth. in DC.*

HAB. Umpqua River, Northern Oregon.—Plant 12 to 18 inches high. Primordial leaves much larger than the later ones, acute at the base, the petioles very long; secondary leaves about an inch long. Peduncle bi-trichotomously divided at the summit. Involucre tubular-campanulate, somewhat truncate, and obtusely 5-toothed. Perianth smooth; the divisions nearly equal. Filaments and ovary smooth. Bracteole plumose. Embryo a little curved. Perhaps too near the following.

9. *ERIOGONUM NUDUM*, *Dougl. in Benth.*

HAB. Southern Oregon and Valley of the Sacramento. Leaves green above in the living plant and white underneath; but in dry specimens brown above and tawny on the underside. Scape-like peduncles 2 to 3 feet long. Flowers cream-colored.

10. *ERIOGONUM ELATUM*, *Dougl. in Benth.*

HAB. Between the Spilen River and Upper Columbia; also on the Walla-Walla; commonly on hillsides.—Root or rhizoma thick and ligneous. Leaves 3 to 6 inches long and  $1\frac{1}{2}$  to 2 inches wide; the petiole about the length of the lamina. Peduncle 4 or 5 feet long. Perianth not attenuated at the base, the divisions nearly equal, hairy near the middle externally. Bracteoles hairy.

11. *ERIOGONUM DECUMBENS*, *Benth.*

HAB. Upper Columbia and its tributaries, Washington Territory; common on sandy banks.

12. *ERIOGONUM TRACHYGONUM*, *Torr. in DC.*

HAB. Valley of the Upper Sacramento, California.—Much branched from a decumbent woody base; the ascending branches about a foot or more high. Inner divisions of the perianth a little longer and narrower than the outer ones. Ovary and achenium muriculate scabrous on the angles.

13. *ERIOGONUM ACETOSELLOIDES*, *Torr. in DC.* (Tab. 14, A.)

HAB. On the American Fork of the Sacramento, California. We have it also from the Lower Sacramento, collected by the Rev. Mr. Fitch and Mr. Shelton.

PLATE 14, A. *ERIOGONUM ACETOSELLOIDES*: an entire plant of the natural size. Fig. 1. Involucre and bracts. 2. A separate flower, with its pedicel and a single bracteole. 3. Portion of a pedicel with two bracteoles. 4. A stamen, front view. 5. Back view of the same. 6. An exterior division of the perianth. 7. An inner division of the perianth, with three stamens attached to its base. 8. Ovary. 9. Achenium. 10. Seed. 11 and 12. Embryos; the latter from a perfectly mature seed.

14. *ERIOGONUM VIMINEUM*, Dougl. in Benth.

HAB. Kooskooskee River, Washington Territory, and Rogue River, Northern Oregon; also, the var. *eriodadon*, Benth., Lower Sacramento, California.

15. *ERIOGONUM CONFERTIFLORUM*, Benth. in DC.

HAB. Shasta River, in Northern California, and on the Walla-Walla, in Oregon.

2. *CHORIZANTHE*, Benth.

1. *CHORIZANTHE ANGUSTIFOLIA*, Nutt.

*Chorizanthe angustifolia*, Nutt. Pl. Gamb. in Jour. Acad. Philad. n. ser. 1, p. 167; Benth. in DC. Prodr. 14, p. 26.

HAB. Near San Francisco, California.—Stem diffusely branched. Involucre unequally 6-toothed, the teeth subulate, the 3 exterior much longer than the 3 inner ones. Lobes of the perianth oblong, emarginate, mucronate. Achenium oblong, glabrous. Seed conformed to the pericarp, nearly terete. Embryo straight, the cotyledons narrowly oblong. [A depauperate state of *C. pungens*, Benth.]

3. POLYGONUM, *Linn.*1. POLYGONUM PARONYCHIA, *Cham. & Schlect.*

HAB. Puget Sound, and southward to San Francisco; on the sea beach.—A well-characterized and rather showy species; remarkable for its woody stem, large dense spikes, and thick revolute leaves, the midrib of which is channelled and ciliolate on each side. The *Polygonum* which Drummond found in West Florida, and which Hooker thought might be this species, is probably *P. glaucum* of Nuttall, which most botanists regard as only a variety of *P. aviculare*.

2. POLYGONUM AVICULARE, *Linn.*

Var. SCABRELLUM: *diffusum; ramulis geniculatis scabris, foliis ovatis utrinque acutis.*

HAB. Puget Sound and Upper Columbia, southward to the Valley of the Sacramento. Var. *scabrellum*, Satchap River, a tributary of the Chihalis, Washington Territory. [This now is *P. minimum*, S. Watson.]

3. POLYGONUM TENUE, *Michx.*

HAB. Upper Columbia and its tributaries, and eastward to Puget Sound.—Flowers rose-color, larger than in the plant of the Eastern States, the sheaths also longer. [It is mixed with *P. coarctatum*.]

4. POLYGONUM COARCTATUM, *Dougl. in Hook.*

HAB. Interior of Washington Territory, and Valley of the Sacramento, California. [The specimens are in part *P. imbricatum*, Nutt. (Washington Territory), and those of California are *P. Bolanderi* of Brewer.]

5. POLYGONUM POLYGALOIDES, *Meisner in DC.*

HAB. Between the Spokane and Kooskooskee Rivers, Washington Territory; in wet places.—A remarkable species, and appropriately named by Meisner. The whole plant scarcely six inches high; the stem mostly simple and very slender. Spikes few-flowered. Bracts obovate-oblong, obtuse, with a broad white somewhat crenulate border, the central part thick and greenish, with a narrow keel on the exterior side, and a free border next the flowers.

6. POLYGONUM ACRE, *H. B. K.*

HAB. Valley of the Lower Sacramento, California.—A common species in most parts of the United States and Mexico, as well as South America. Achenia mostly triangular, but sometimes lenticular.

7. POLYGONUM AMPHIBIUM, *Linn.*

HAB. Var. *aquaticum*, Linn., near Nisqually, Puget Sound. Var. *terrestre*, Leers, California, in the Valley of the Lower Sacramento.

8. POLYGONUM NODOSUM, *Pers.*

HAB. Valley of the Upper Sacramento; common in moist places.

9. POLYGONUM VIVIPARUM, *Linn.*

HAB. Upper Columbia and Kooskooskee Rivers; common in wet places.

4. RUMEX, *Linn.*1. RUMEX MARITIMUS, *Linn.*

HAB. Shores of Puget Sound, and in other parts of Washington Territory, not confined to the neighborhood of the sea; southward to the coast of California.



2. RUMEX VENOSUS, *Pursh.*

HAB. Interior of Washington Territory; especially along the Upper Columbia and its tributaries; eastward to the sources of the Missouri and Platte. Dr. Newberry found it on the Cascade Mountains, 7000 feet above the sea.—Plant 12 to 18 inches high; the base often decumbent. Leaves 2 to 5 inches long, and 1 or 2 inches wide; the lowest resembling the others, only broader. Valves of the fructiferous calyx larger than any known species (nearly an inch in diameter), and always without a callosity.

3. RUMEX LONGIFOLIUS, *DC., Meisner.*

HAB. Fraser's River, British Columbia, *Dr. Holmes*.—Plant 3 to 4 feet high. Lower leaves 6 or 7 inches long, ovate, oblong, rather acute, undulate on the margin, cordate at the base. Fructiferous panicle  $1\frac{1}{2}$  to 2 feet long, nearly leafless. Pedicels a little longer than the fructiferous calyx; valves nearly orbicular, 4 lines in diameter, strongly reticulated, entire, or slightly crenulate toward the base, without any callosity. This *Rumex* wholly resembles specimens of *R. domesticus*, Hook., collected by Drummond, but may be different from the European plant. The specific name of De Candolle is by no means appropriate.

4. RUMEX SALICIFOLIUS, *Weinm.*

HAB. Upper Columbia, Washington Territory, southward to San Francisco, California.—A widely diffused species, being indigenous to the whole breadth of the continent from about latitude 40° northward.

5. RUMEX ACETOSA, *Linn.*

HAB. Nisqually, Puget Sound; in prairies. We have this plant also from Gros Cape, on the north side of Lake Superior, where it was found by Dr. Pitcher.

## ORD. 70. ELÆAGNACEÆ.

### 1. SHEPHERDIA, *Nutt.*

#### 1. SHEPHERDIA CANADENSIS, *Nutt.*

HAB. Shores of the Gulf of Georgia (Dr. Holmes), and in woods around Puget Sound. This shrub extends across the continent, following eastward the Great Lakes and the St. Lawrence. On the Pacific coast it forms a handsome shrub, 8 feet in height.

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## ORD. 71. LORANTHACEÆ.

### 1. PHORADENDRON, *Nutt.*

#### 1. PHORADENDRON FLAVESCENS, *Nutt.*

*Phoradendron flavescens*, Nutt. in Jour. Acad. Phil. n. ser. 1, p. 185; Engelm. in Gray Pl. Fendl. p. 59.

*Viscum flavescens*, Pursh Fl. 1, p. 114 (excl. syn.); Torr. & Gray, Fl. 1, p. 654.

*V. Reichenbachianum*, Seem. Bot. Herald, p. 294, t. 262.

*V. verticillatum*, Nutt. Gen. 2, p. 235; Ell. Sk. 2, 677, non *Linn.*

HAB. On the Sacramento River, particularly on the lower part of the river, and around the Bay of San Francisco; not rare, on various

trees.—A stout species, the terete branches and young leaves clothed with a short velvety pubescence, which nearly disappears with age. Leaves 1 to 2 inches long, broadly obovate, obtuse, mostly 5-nerved from the base, abruptly narrowed at the base into a short petiole. Staminate flowers in interrupted, mostly 4-jointed spikes, which are from half to three-fourths the length of the leaves. Anthers 2-celled. Perianth 3-parted. Fruit about the size of a pepper-corn; the color uncertain in the dry specimens. In the Botany of Whipple's Report it is incorrectly stated that the anthers are one-celled; they appear to be so when old, because the terminal chinks are closely approximated, and are in a line with each other.

## 2. PHORADENDRON FLAVESCENS, var. PUBESCENS, *Engelm.*

*Phoradendron flavescens*, var. *pubescens*, Engelm. in Gray, Pl. Lindheim, 2, p. 212; Torr. Bot. Mex. Bound. p. 134.

*Viseum villosum*, Nutt. in Torr. & Gray, Fl. 1, p. 654.

HAB. Parasitic on trees (the particular kinds not recorded); from the Umpqua Mountains southward to the Lower Sacramento; forming large bunches. This, except in the pubescence and smaller leaves, seems to differ in no essential characters from *P. flavescens*.

Another species of this genus was found by Dr. Pickering on the Shasta Mountain, but the specimens are not sufficiently complete for determining whether it is undescribed or not. It grows on a species of Juniper, in thick-set rigid bunches, which are about 4 inches high. It is perfectly smooth, with narrowly-oblong obtuse leaves, which are about three-fourths of an inch long. The inflorescence is scarcely developed, but seems to be in few-flowered spikes. The flowers are 3-cleft. Dr. Pickering in his notes states that the fruit is "the size of beaver shot." It differs from any other North American species known to us. [Probably *P. Bolleanum*, Seemann.]

## 2. ARCEUTHOBIMUM, *Bieberst.*

[There is a memorandum indicating the existence of one or more species of this genus in the collection, but no determinations.]

## ORD. 72. SANTALACEÆ.

### 1. COMANDRA, *Nutt.*

#### 1. COMANDRA UMBELLATA, *Nutt.*

HAB. Common on the prairies of Oregon and Washington Territory; also in Northern California. Most of the specimens are suffrutescent. [Some of them are of *C. pallida*, A. DC. Prodr. 14, p. 636.]

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## ORD. 73. LAURACEÆ.

### 1. TETRANTHERA, *Jacq.*

#### 1. TETRANTHERA CALIFORNICA, *Hook. & Arn.*

HAB. Southern Oregon, and Valley of the Sacramento and elsewhere in California.—This, the now familiar *California Laurel*, is a fine ornamental tree, which seems to attain its greatest altitude on the Upper Sacramento, where Mr. Brackenridge noticed some trees that were fully sixty feet high, and with trunks three feet in diameter; and Douglas computed the height of some he saw at 120 feet. The odor is so pungent and intense as to produce headache and sickness. The wood is very beautiful, and is used for fine cabinet-work.

## ORD. 74. SAURURACEÆ.

### 1. ANEMOPSIS, *Nutt.*

#### 1. ANEMOPSIS CALIFORNICA, *Nutt.*

*Anemopsis Californica*, Nutt. in Tayl. Ann. Nat. Hist. 1, p. 136; Hook. & Arn. Bot. Beech. p. 390, t. 92.

HAB. Borders of marshes on the Lower Sacramento; common. [The name, as originally proposed by Nuttall, was *Anemia*. This, being essentially preoccupied, was changed at the time of publication by the editor into *Anemopsis*.]

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## ORD. 75. CALLITRICHACEÆ.

### 1. CALLITRICHE, *Linn.*

#### 1. CALLITRICHE VERNA, *Linn.*

HAB. California, in flowing water, near San Francisco.

ORD. 76. CERATOPHYLLACEÆ.

1. CERATOPHYLLUM, *Linn.*

1. CERATOPHYLLUM DEMERSUM, *Linn.*

HAB. Nisqually, Washington Territory, and all around the Northern Hemisphere.

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ORD. 77. EUPHORBIACEÆ.

1. CROTON, *Linn.*

1. CROTON (HENDECANDRA) PROCUMBENS, *Eschsch.*

*Hendecandra procumbens*, Eschsch. in Mem. Acad. Petersb. 10, ex Linnæa 3 (Litterat.), p. 150; Hook. & Arn. Bot. Beech. p. 389, t. 91.

*Croton (Hendecandra) procumbens*, Torr. Bot. Mex. Bound. Surv. p. 195.

*C. gracile*, H. B. K. Nov. Gen. & Sp. 2, p. 69.

*Astrogyné Crotonoides*, Benth. Pl. Hartw. p. 14.

HAB. On the Lower Rio Sacramento, and around San Francisco, California; growing in loose sand.—This is a widely diffused species, extending southward and eastward to the Gulf of Mexico. The figure in *Bot. Beechey* well represents the ordinary forms of this variable species.

2. EREMOCARPUS, *Benth.*1. EREMOCARPUS SETIGERUS, *Benth.*

*Eremocarpus setigerus*, Benth. Bot. Sulph. p. 53, t. 26.

*Croton?* *setigerus*, Hook. Fl. Bor.-Am. 2, p. 141.

HAB. Sandy plains from Southern Oregon to San Francisco; extremely common throughout California.

3. EUPHORBIA, *Linn.*1. EUPHORBIA GLYPTOSPERMA, *Engelm.*

*Euphorbia glyptosperma*, Engelm. in Bot. Mex. Bound. Rep. p. 187.

*E. polygonifolia*, Hook. Fl. Bor.-Am. 2, p. 140.

HAB. Banks of the Clear Water (Kooskooskee), Washington Territory.—A form with the leaves nearly entire.

2. EUPHORBIA INEQUILATERA, *Sonder?*

HAB. "This is an *Euphorbia* which I had raised from seeds brought from Sacramento City, California, and named *E. subserrata*. Subsequently it was collected by Dr. Newberry in Ives' Colorado Expedition, and it seemed to me to be a form of the variable *E. inequilatera*. It differs from that plant (at least from the form of it that is common on the western prairies of the Upper Missouri, &c.) in its dentate, involucral appendages, and especially by the shorter and comparatively thicker and less undulate seeds, and scarcely serrate leaves. It seems to be almost intermediate between *E. petaloides* and *E. inequilatera*." —*Engelmann*.

3. EUPHORBIA DICTYOSPERMA, *Fisch. & Meyer.*

*Euphorbia dictyospermum*, Fisch. & Mey. Ind. Sem. Petrop. 1835; Engelm. in Bot. Mex. Bound. Rep. p. 191.

*E. Arkansana*, Engelm. & Gray, Pl. Lindl. 1, p. 26; Gray, Man. Bot. ed. 2, p. 388.

HAB. Valley of the Kooskooskee; a common western species.

4. EUPHORBIA CRENULATA, *Engelm., l. c.*

HAB. Near San Francisco, California.—The specimens are without flowers or fruit, but there can be no doubt of their identity with Engelm.ann's plant.

## ORD. 78. URTICACEÆ.

1. URTICA, *Tourn.*1. URTICA DIOICA, *Linn.*

HAB. Ravines near San Francisco; probably not indigenous. There are also specimens in the collection of an *Urtica* collected in woods near Puget Sound, which may be only a state of *U. dioica*. It is very sparingly bristly; the leaves larger and thinner, broadly ovate-cordate, and very coarsely toothed. Its unusual characters are probably owing to the plant having grown in a shady place. [The specimens in herb. Torrey. belong to *U. dioica* and *U. holosericea*, Nutt.]



2. PARIETARIA, *Tourn.*1. PARIETARIA PENNSYLVANICA, *Muhl.*

HAB. In the country between the Walla-Walla and Kooskooskee Rivers, Washington Territory. No station for this plant west of the Rocky Mountains has hitherto been recorded.

3. CELTIS, *Tourn.*1. CELTIS OCCIDENTALIS, *Linn.*

HAB. Banks of the Kooskooskee, Washington Territory, where it is usually only a small tree 10 to 15 feet high. Near Port Discovery, Puget Sound, it was found attaining the height of 50 feet. The leaves are rougher than is usual in this species. It is probable that (excepting *C. pallida*, Torr., and perhaps *C. reticulata*) all the North American species of *Celtis* are only states of *C. occidentalis*.

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ORD. 79. GARRYACEÆ.1. GARRYA, *Lindl.*1. GARRYA ELLIPTICA, *Lindl.*

*Garrya elliptica*, Lindl. Bot. Reg. t. 1686; Loud. Enc. Trees & Shrubs, p. 926, fig. 1730.

HAB. On serpentine rocks fronting Angel Island; common near the coast of Oregon and California.—Although this is commonly a low shrub, only three or four feet high, it often has a trunk six inches in diameter at the base.

## 2. GARRYA FREMONTII, Torr.

*Garrya Fremontii*, Torr. Bot. Whipl. Rep. Pacif. R. Road Expl. 4, p. 136.

HAB. Umpqua Mountains, Southern Oregon.—The specimens are all female and in fruit. Those of Fremont, from which the original description was drawn, are all male. The characters, as given in the work quoted, seem to be constant, except that the leaves are sometimes oval, or obovate, and obtuse. The fertile flowers are sessile, and there is but one under each bract. The fruit is more or less hairy when young, but nearly glabrous and of a dark purple color when mature.

[The genus is now referred to *Cornaceæ*.]

## ORD. 80. PLATANACEÆ.

## 1. PLATANUS, Linn.

## 1. PLATANUS RACEMOSA, Nutt.

*Platanus racemosa*, Nutt. in Audubon, Birds of N. Am., 1, t. 362, & Sylv. 1, p. 47, t. 15; Newberry in Bot. Williamson & Abbot's Rep. (Pacif. R. Road Expl.) 6, p. 33, t. 2, & fig. xylog. 10.

*P. Mexicana*, Moricand, Pl. Rar. Amer. t. 13.

*P. Californica*, Benth. Plant. Hartw. p. 54.

HAB. Abundant along the Sacramento and its tributaries.—In favorable situations this tree occurs from 60 to 80, and even 100 feet in height. Dr. Pickering saw some trunks that were 8 feet in diameter. Its general appearance is that of the Plane-tree, or Sycamore of the Atlantic States, but it is a very distinct species; being much nearer *Platanus orientalis* of the Old World. Dr. Newberry states that the wood is very brittle.

## ORD. 81. CUPULIFERÆ.\*

### 1. QUERCUS, *Linn.*

#### 1. QUERCUS DENSIFLORA, *Hook. & Arn.*

*Quercus densiflora*, Hook. & Arn. Bot. Beech. p. 391; Hook. Ic. 4, t. 380; Newberry in Pacif. R. Road Expl. 6 (Bot.), p. 31, & fig. xylog. 8.

*Q. echinacea*, Torr. in Pacif. R. Road Expl. 4; Bot. Whipl. Rep. p. 137.

HAB. Valley of the Upper Sacramento, California.—Mr. Brackenridge found this handsome evergreen oak attaining the height of 25 or 30 feet, with a trunk not more than 6 inches in diameter. In the specimens before us all the leaves are entire, and mostly obtuse; in which state they strongly resemble those of the Live Oak (*Q. virens*) of the Southeastern States. Very often, however, the leaves are sharply and conspicuously serrate, with the apex acute. When young they are whitish-tomentose underneath, but nearly smooth when old. The fertile flowers are 8–12-androus; the anthers 2-celled, and apparently polliniferous. The acorns are two or three together on a short erect peduncle, globose-ovate or ovate, obtuse, with a short abrupt point. The cup is hemispherical, about three-fourths of an inch in diameter, and clothed with rigid subulate or filiform scales, which at length are reflexed or recurved. This character occurs in all the specimens that I have seen of this oak. As the figure of Hooker represented the scales as lanceolate and appressed (as does also that of Newberry), I supposed our species must be distinct, and accordingly described it in the work above quoted as *Q. echinacea*. In the dense-clustered and erect staminate aments, the staminiferous

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\* This was written before the appearance of the volume of DeCandolle's Prodrômus containing the *Cupuliferæ*, &c., and had not been since revised by the author.

fertile flowers, and in the somewhat prickly cup, as well as in the leaves (when serrate), this oak resembles a *Castanea*, and especially *C. chrysophylla* of California. Dr. Newberry states that the acorn is somewhat triangular, but it does not show that character in mature dry specimens.

## 2. QUERCUS CHRYSOLEPIS, *Liebm.*

*Quercus chrysolepis*, Liebm. Querc. Neo. Mex. & Calif.\* p. 173; Benth. Pl. Hartw. p. 336; Torr. Bot. Mex. Bound. Rep. p. 207.

*Q. crassipocula*, Torr. in Pacif. R. Road Rep. 5, p. 365, t. 9, & Bot. Whipl. Rep. p. 137.

*Q. fulvescens*, Kellogg in Proceed. Calif. Acad. Nat. Sc. 1, pp. 67 & 71; Newberry, l. c. p. 27, fig. 5.

HAB. Southern Oregon and mountains of Northern California.—This oak is extremely variable in the size and form of the leaves and acorns. On high mountains it is a mere shrub, 8 to 10 feet high, but on the foot-hills of the Sierra it rises to the height of 40 feet, with a trunk 12 inches or more in diameter. The leaves are evergreen, usually about 2 inches long, ovate, abruptly pointed, shining above, and yellowish downy underneath. They are usually entire, but often acutely toothed, even on the same branch. We have specimens collected by Col. Fremont on the Sierra Nevada, at the height of 9400 feet, of a shrubby state of this species, in which the leaves are scarcely three-fourths of an inch long, rather obtuse, and either entire or the upper part sharply dentate-serrate. The acorns are still more variable; the gland sometimes narrowly oblong, tapering to a point, and scarcely one-third of an inch in transverse diameter. More commonly it is  $1\frac{1}{2}$  inch long, and  $\frac{3}{4}$  of an inch in diameter, ovate, obtuse, with a short abrupt point; but occasionally they are of great size, as represented in the figure above quoted. The cup is thick, shallow, and velvety, the protuberant broadly ovate scales giving it a somewhat tuberculate appearance.

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\* In "Oversigt det Kgl. Danske Videnskabernes Selskabs Forhandlinger og dets Medlemmers Arbejder, i Aaret 1854, Kjöbenhavn."

## 3. QUERCUS AGRIFOLIA, Née.

*Quercus agrifolia*, Née in Ann. de Cienc. Nat. 3, p. 281, fide Liebm. l. c.; Hook.

Ic. 4, t. 377; Nutt. Sylv. 1, p. 5, t. 2; Newberry, l. c. p. 32.

*Q. oxyadenia*, Torr. in Sitgr. Rep. t. 17.

*Q. acutiglandis*, Kellogg, in Proceed. Calif. Acad. Nat. Sc. p. 1, 25.

HAB. Valley of the Sacramento, from Shasta Butte southward, and on the Coast Mountains, to the borders of Mexico; common.—This is the species most frequently known in California by the name of Evergreen Oak or Scrub Oak. It is often rather a large shrub than a tree. On the Sacramento it is sometimes 40 feet high, and then possesses considerable beauty, having the general appearance of Live Oak. Like all the evergreen oaks of California, the leaves present a great variety in size and outline. They are from nearly 3 inches to scarcely an inch in length, and from 2 inches to less than half an inch in diameter; the margin either entire or remotely and sharply toothed. The larger leaves (at least in dry specimens) are more or less bulate. The acorns are sometimes ovate and half immersed in the cup, but commonly more or less elongated and acute; occasionally very narrow, almost like a cockspur. The cup is always deep, and clothed with brown shining scales, which project and form a fringe around the margin.

## 4. QUERCUS OBLONGIFOLIA, Torr., Var. BREVILOBATA.

*Q. foliis perennantibus anguste vel ovato-oblongis utrinque obtusis vel basi cuneatis subtus griseo-tomentosis supra pubescentibus deinde grabratis breviter paucilobatis, lobis obtusis vel sinuato dentatis vel subintegerimis; fructibus solitariis sessilibus; cupula hemisphærica, squamis ovatis obtusiusculis appressis interdum incrassatis; glande ovato- vel angusto-oblonga acuta cupula 3-5-plo longiore.*

*Q. Ransomi*, Kellogg in Proceed. Calif. Acad. Nat. Sc. 1, p. 25.?

HAB. Mountains of the Upper Sacramento.—A tree 40 feet high, with a trunk 1 foot in diameter; the branches spreading but little, and clothed with a dense foliage. Leaves 2 to 3 inches long, and

$\frac{3}{4}$  to  $1\frac{1}{2}$  inch wide, clothed with grayish pubescence on both sides; but when old nearly smooth above, and the under surface somewhat rusty in dry specimens. In some individuals the leaves are narrowly oblong, very obtuse, and either perfectly entire or slightly repand-toothed towards the extremity. The broader leaved forms are cut on each side into 2 to 4 short lobes or coarse teeth, which are slightly pointed, but not mucronate. Between these two forms there are others that are intermediate, so that they all clearly belong to one species. The acorns vary considerably in size; the cup, from one-third to three-fourths of an inch in diameter, embraces from one-fifth to one-fourth of the gland. It is thin, closely sessile, the scales very small, and not projecting beyond the margin; they are sometimes thickened and convex, giving the cup a somewhat tuberculate appearance. The gland 8 to 10 lines long, and either ovate-oblong or very narrow in proportion to its length. Like several other Californian and Oregon Oaks, the extreme forms of this one differ so much that they might easily be mistaken for distinct species. If we are correct in referring them all to *Q. oblongifolia*, the species has an extensive range, but we have never seen specimens from southern and western stations that exhibited a tendency to form lobed leaves.

##### 5. QUERCUS LOBATA, Née. (Tab. XV.)

*Quercus lobata*, Née in Anal. de Cien. Nat. 3, p. 270 (fide Liebm. l. c. p. 172); Torr. Bot. Mex. Bound. Rep. p. 205.

*Q. Hindsii*, Benth. Bot. Sulph. p. 55; Torr. Bot. Whipl. Rep. p. 138; Newberry in Pacif. R. Road. Rep. Bot. p. 27, f. 5 (xylog.), & tab. 1.

HAB. Sides of hills in the Valley of the Sacramento, and on the Coast Range of Mountains, as far south as Monterey. This is the noblest oak of California, and there takes the place of *Q. alba* of the Eastern States. Dr. Newberry often saw trees of it 6, 7, or more feet in diameter. Near Marysville he measured the trunk of one that was six feet in diameter three feet from the ground, and estimated its height at seventy-five feet; the branches spreading horizontally more than sixty feet. The timber, however, is far less valuable than that of the White Oak, being brittle and porous. On high mountains the tree is much reduced in size, and the acorns also. The latter are

commonly about 2 inches long, tapering to a point, and often a little curved; but sometimes they are much shorter, ovate, and rather obtuse, in which state the species was described by Née more than half a century ago as *Q. lobata*. The *Q. longiglanda*, of Fremont's Geographical Memoir on California and Oregon, is this tree with long acorns. The cup is shallow and tuberculate, with thickened scales. On young and vigorous shoots the leaves are acutely lobed.

PLATE 15. QUERCUS LOBATA: Branch in fruit. Fig. 1, 2. Leaves. 3, 4. Acorn and cupule. All of the natural size.

#### 6. QUERCUS GARRYANA, Hook.

*Quercus Garryana*, Hook. Fl. Bor.-Amer. 2, p. 159; Nutt. Sylv. 1, p. 1, t. 1.

HAB. Near Nisqually, Puget Sound, and on the Walla-Walla River.—We have no mature fruit of this species, and it is remarkable that Nuttall has not given a figure of the acorn. This is another oak of the group to which *Q. alba* belongs. It occurs from 40 to 80 feet or more in height, and 3 to 6 feet in diameter. The wood is used for ship-building, and Mr. Nuttall states that it is quite equal to that of the White Oak.

#### 7. QUERCUS DOUGLASII, Hook. & Arn.

*Quercus Douglasii*, Hook. & Arn. Bot. Beech. p. 391; Hook. Ic. 4, t. 383 & 384; Nutt. Sylv. 1, p. 10, t. 4.

HAB. Northern California, southward to San Francisco.—This species is sometimes rather difficult to distinguish from *Q. lobata*, especially when the leaves are deeply cut. In *Q. Douglasii* the lobes are more acute, and form a more acute angle with the midrib, while the sinuses are narrow and more acute; also the scales of the cup are flat; not tumid, as in *Q. lobata*. In our specimens from the neighborhood of San Francisco the acorns and leaves are considerably smaller than those represented in Hooker's figure. Dr. Pickering states that the tree is about 40 feet high.

8. QUERCUS KELLOGGII, *Newberry*.

*Quercus Kelloggii*, Newberry, l. c. p. 28, fig. xylog.

*Q. tinctoria*, var. *Californica*, Torr. Bot. Whipl. Rep. p. 138.

HAB. On the sides of mountains, from the northern borders of California, southward to San Rafael and Santiago.—In favorable situations this tree is 60 feet high, and 3 feet in diameter, but more commonly it is of moderate stature and of irregular growth. It is closely allied to *Q. tinctoria*, and in Whipple's Report I described it as a variety of that species, but I now regard it as distinct, and adopt the name given to it by Dr. Newberry. It also resembles *Q. coccinea*. In the character of the bark and trunk it resembles the former. The lobes of the leaves are drawn out to a more bristle-like point than is represented in the figure quoted above. The acorns, which vary from globose-ovate to elliptical, are sometimes more than an inch and a half long and an inch in diameter, which is one-third greater than their usual size. The cup is still more variable, being sometimes only one-third the length of the gland, and occasionally inclosing all but the summit.

2. CASTANOPSIS, *Spach*.1. CASTANOPSIS CHRYSOPHYLLA, *A. DC. Prodr.*

*Castanea chrysophylla*, Dougl. in Hook. Fl. Bor.-Amer. 2, p. 159; Hook. Lond. Jour. Bot. 2, p. 495, t. 16; Torr. in Bot. Whipl. Rep. p. 137; Newberry l. c. p. 26, fig. 4 (xylog.).

*C. sempervirens*, Kellogg in Proceed. Calif. Acad. Nat. Sc. 1, p. 71.

HAB. On the Columbia River, Oregon, and in California as far south as Monterey.—It is often a mere shrub, bearing abundance of fruit when only 3 or 4 feet high. On the Umpqua Mountains Mr. Brackenridge saw trees of it 30 and 40 feet high. In other parts of California, as at Santa Cruz and Bolanas Bay, it occurs 50 and 60 feet high. The leaves vary from ovate and rather obtuse to lanceolate and acuminate,



and are always perfectly entire. The yellow color of the under side of the leaves sometimes disappears wholly or in part. The male catkins are shorter and more rigid than in the common chestnut; the burr is scarcely one-third as large, with shorter prickles. The nut (which seems to be always solitary) resembles that of the Chinquapin (*C. pumila*), but the shell is almost as thick as in the European filbert. This species much more resembles some of the Asiatic chestnuts, especially *C. Javanica*, than those of the Eastern States.

[In the present case the received generic name has been substituted in the MSS.]

### 3. CORYLUS, *Tourn.*

#### 1. CORYLUS ROSTRATA, *Ait.*

*Corylus rostrata*, Ait. Hort. Kew. ed. 1, 3, p. 364; Loud. Enc. of Trees, p. 925, f. 1727.

HAB. Between Spokane River and Fort Colville, on the Upper Columbia; also at Puget Sound, and southward to San Francisco.—We have specimens of a *Corylus* from Dr. Scouler, collected on the Columbia River, which we doubt not is *C. Americana*, var. Hook. Fl. Bor. Amer. 2, p. 160. Hooker states that he had seen no fruit of his variety; but the specimens of the Exploring Expedition have mature fruit, which wholly resemble that of the eastern *C. rostrata*.

## ORD. 82. MYRICACEÆ.

### 1. MYRICA, *Linn.*

#### 1. MYRICA CALIFORNICA, *Cham. & Schlecht.*

*Myrica Californica*, Cham. & Schlecht. in *Linnaea*, 6, p. 535; Hook. Fl. Bor.-Amer. 2, p. 260; Hook. & Arn. Bot. Beech. p. 390.

HAB. Gray's Harbor, Washington Territory and southward to the shores of San Francisco Bay.—On the banks of the American River, a tributary of the Sacramento, a variety is found 12 to 15 feet high, with the under surface of the leaves pubescent, and the upper dull. The ordinary form, with the upper surface of the leaves a little shining and the under side smooth, is common in ravines and fertile spots on the coast, near San Francisco, where it sometimes occurs 20 feet high, with a trunk 9 inches in diameter. The berries are larger than in *N. cerifera*. Hooker is of opinion that this species is not distinct from *M. Xalapensis*, H. B. K., but he retains it in the works quoted above, and we have no specimens for comparison.

## ORD. 83. BETULACEÆ.

### 1. BETULA, *Tourn.*

#### 1. BETULA OCCIDENTALIS, *Hook.*

*Betula occidentalis*, Hook. Fl. Bor.-Amer. 2, p. 154; Nutt. Sylv. 1, p. 22, t. 7.  
*B. rhombifolia*, Nutt. l. c. t. 8.?

HAB. Banks of rivers in all parts of Washington Territory.— Varying in height from 6 to 25 feet. There are small-leaved specimens with male aments from Nisqually, Puget Sound, which seem to be Nuttall's *B. rhombifolia*, the only difference being that the latter is described as having the leaves dotless, whereas they are minutely dotted in the Nisqually plant. I have not seen the leaves so large as they are described by Hooker.

### 2. ALNUS, *Tourn.*

#### 1. ALNUS VIRIDIS, *DC.*

*Alnus viridis*, Fl. Franc. 3, p. 304; Bongard Veg. Sitch. 162; Hook. Fl. Bor.-Am. 2, p. 157.  
*A. Oregona*, Nutt. Sylv. 1, p. 28, t. 9; Newberry, Bot. Williamson & Abbot's Rep. p. 25.

HAB. On banks of streams and in woods, Port Discovery, Puget Sound; common also in Oregon. This is certainly the *A. viridis* of Hooker and Bongard, of which I have specimens from the Pacific coast, named by those botanists. It is also the same as No. 811 of Fendler's New Mexican Collection (1847).

2. *ALNUS RUBRA*, *Bongard, l. c.*

HAB. In woods, Puget Sound. In this species the leaves are pubescent underneath and the veinlets connecting the primary veins are more prominent than in *A. viridis*; the fructiferous catkins, also, are thicker, and on very short peduncles. The fruit is strongly winged.

3. *ALNUS RHOMBIFOLIA*, *Nutt.*

*Alnus rhombifolia*, Nutt. Sylv. 1, p. 33.

HAB. Valley of the Sacramento, California, along the river; not very common. This species sometimes acquires the stature of 40 feet, with a slender trunk 3 inches in diameter. The leaves (at least when young) are nearly smooth, somewhat shining above and slightly pubescent underneath, finely and doubly serrate, with the serratures thickened at the tip. The fructiferous catkins are in a terminal cluster and are supported on rather long but stout and rigid peduncles. Scales dilated and entire at the tip, cuneate below. Fruit with a thin, very narrow margin, but not winged. Nuttall found this species near Monterey, but he did not detect any of the fruit. There is little doubt of our plant being the same as his. Near San Rafael Dr. Pickering collected specimens of an *Alnus* which seem almost to connect this species with *A. incana*, var. *glauca* (*A. glauca*, Michx.). The leaves are broadly ovate, obtuse or slightly acute at the base, shining above, a little hairy on the veins underneath, otherwise smooth; the serratures and fructification as in *A. rhombifolia*. Hooker regards *A. serrulata* as not distinct from *A. incana*.

## ORD. 84. SALICACEÆ.

### 1. POPULUS, *Tourn.*

#### 1. POPULUS MONILIFERA, *Ait.*

*Populus monilifera*, Ait. Hort. Kew. ed. 1, 3, p. 406; Michx. Sylv. 2, p. 121, t. 98, fig. 1.

HAB. Banks of the Sacramento River, California; rare. This is the most widely spread of all those species of Poplar that are known by the name of Cottonwood. It does not, however, extend north of the Upper Sacramento, but to the south it is found nearly to the Gulf of California; eastward to the Atlantic.

#### 2. POPULUS TREMULOIDES, *Michx.*

*Populus tremuloides*, Michx. Fl. 2, p. 143; Michx. f. Silv. 2, p. 125, t. 99. fig. c. Newberry, Bot. Williamson & Abbott's Rep. p. 25.

HAB. Borders of rivers, Oregon and Washington Territory; frequent in the interior, but also occurs near Fort Nisqually, Puget Sound. The largest trees of this Poplar seen by Dr. Pickering were 60 feet high and four inches in diameter.

#### 3. POPULUS ANGUSTIFOLIA, *James.*

*Populus angustifolia*, James in Long's Exp. Rocky Mount. 1, p. 497; Torr. in Ann. Lyc. N. York, 2, p. 249; Nutt. Sylv. 1, p. 52, t. 16.

HAB. Near Fort Okanagan, on the Upper Columbia, Washington

Territory, and down the river to the sea. On the Pacific coast it does not appear to extend much south of the Columbia, except along the Willamette, but to the east it is common on the upper tributaries of the Missouri, thence south to the mountains of New Mexico. In Oregon it attains its greatest magnitude, being nearly as large as *P. monilifera*. It is very near *P. longifolia*, Fisch., which Loudon regards as a narrow-leaved variety of the following species.

#### 4. *POPULUS BALSAMIFERA*, Linn.

*Populus balsamifera*, Linn. Sp. p. 1464; Michx. Sylv. 2, t. 93; Hook. Fl. Bor.-Amer. 2, p. 153; Loud. Arb. p. 830, fig. 1507-1510.

HAB. Banks of the Columbia.—This is called *Balsam Tree* and *Balsam Poplar* in Oregon, where it is frequent, and ranks among the tallest of the deciduous trees. The leaves in all the specimens are ovate or oblong-ovate, scarcely at all acuminate, and mostly rather acute at the base, finely serrate-toothed, the under surface very pale or whitish, and smooth.

#### 5. *POPULUS TRICHOCARPA*, Torr. & Gray.

*Populus trichocarpa*, Torr. & Gray in Hook. Ic. 9, t. 878; & in Bot. Whipl. Rep. p. 204.

*P. balsamifera*, var. Hook. Fl. Bor.-Amer. 2, p. 154.

HAB. Along rivers, between Puget Sound and the Cascade Mountains, Washington Territory.—This seems to be a common species in the Pacific States. Dr. Pickering in his notes remarks that it is a tall tree, but he does not state the height. It is allied to *P. balsamifera*, but is readily distinguished by the subglobose, hairy, and closely sessile fruit. The foliage greatly resembles that of *P. candicans*, which Hooker considers a variety of *P. balsamifera*. It is undoubtedly his last variety of the latter species, but he does not quote the synonym in his Icones.

## ORD. 85. CONIFERÆ.

[Instead of prepared manuscript only some rough notes were found, from which it appears that most of the common and now well-known Coniferous trees of Oregon and Northern California were represented in the collection; but there is no systematic enumeration or account of them which could be printed. Of the Monocotyledonous Orders there is no manuscript at all to be found, except of the *Cyperaceæ*, exclusive of the genus *Carex*. Among the notes relative to *Coniferæ* was found the subjoined explanation of Plate 16.]

PLATE 16. CUPRESSUS NUTKANUS: a branch, of the natural size. Fig. 1. A male catkin and portion of a branchlet; enlarged. 2. A scale of the same, inside view, showing the stamens; magnified. 3. A female catkin and portion of a branchlet; enlarged. 4. A cone; enlarged. 5. A separate scale of the same. 6. A seed; magnified.

## ORD. 86. CYPERACEÆ.

### 1. DULICHIMUM, *Richard.*

#### 1. DULICHIMUM SPATHACEUM, *Richard.*

*Dulichium spathaceum*, Richard in Pers. Syn. 1, p. 65; Ell. Sk. 1, p. 73, t. 2, f. 3, Hook. Fl. Bor.-Amer. 2, p. 232; Torr. Cyp. in Ann. Lyc. Nat. Hist. N. York; 3, p. 247.

HAB. On the Willamette River, Oregon. We have it also on the Columbia River, collected by Mr. Nuttall.—On the western side of North America this plant has not been found south of Oregon, but on the eastern side it ranges from Canada to Florida.

### 2. CYPERUS, *Linn.*

#### 1. CYPERUS DIANDRUS, *Torr.*

*Cyperus diandrus*, Torr. Cat. Pl. N. York, p. 90, & Cyp. l. c. p. 251; Hook. Fl. Bor.-Amer. 2, p. 232.

HAB. Upper Sacramento, California.—Spikelets nearly sessile, forming a cluster at the summit of the culm, which is slender and 10 to 15 inches long. Nutlets obovate-oblong, dark brown when fully ripe, dull, under a strong lens marked with extremely minute elevated dots arranged in longitudinal lines.



2. CYPERUS ARISTATUS, *Rottb.*

*Cyperus aristatus*, Rottb. Gram. t. 6, f. 1; Kunth, Enum. 2, p. 23; Steudel, Cyp. p. 14; Benth. Pl. Hartw. p. 341; Torr. Bot. Mex. Bound. p. 227.

*C. inflexus*, Muhl. Gram. p. 16; Torr. Fl. M. & N. States, p. 59; & Cyp. l. c. p. 273; Hook. Fl. Bor.-Amer. 2, p. 232; Steud. Cyp. l. c.

*C. uncinatus*, Pursh, Fl. 1, p. 50, non Poir.

*C. pygmaeus*, Nutt. in Amer. Phil. Trans. n. ser. 5, p. 142; non Cav. nec Rottb.

HAB. On the Walla-Walla River, Washington Territory.—After a careful re-examination of this plant, and comparing specimens from many parts of North America with *C. aristatus*, I could find no sufficient character for distinguishing them. It is probable that several other species of the section *Aristati*, in Steudel's Synopsis, should be reduced to this.

3. CYPERUS VIRENS, *Michx.*

*Cyperus vegetus*, Michx. Fl. 1, p. 28; Muhl. Gram. p. 24; Torr. Cyp. l. c. p. 275; Steud. Cyp.

HAB. Valley of the Sacramento, California.—The solitary specimen in the collection accords with some of our numerous forms of this species. Perhaps all of them should be referred to *C. vegetus*, Willd.

4. CYPERUS SCHWEINITZII, *Torr.*

*Cyperus Schweinitzii*, Torr. Cyp. l. c., & Fl. N. York 2, p. 243; & Bot. Mex. Bound. p. 267; Steud. Cyp. p. 19.

*C. Houghtonii*, Torr. l. c.; Steud. l. c.

*C. alterniflorus*, Schwein. in Long's 2d Exped. 2, p. 381, non R. Br.

HAB. On the Kooskooskee River, Washington Territory.—The specimens in this collection confirm the opinion expressed in the Botany of the Mexican Boundary Survey, that *Cyperus Houghtonii* is not distinct from *C. Schweinitzii*.

5. CYPERUS ERYTHORRHIZOS, *Muhl.*

*Cyperus erythrorhizos*, Muhl. Gram. p. 20; Schult. Mant. 2, p. 220; Torr. Cyp. l. c. p. 280; Steud. Cyp. p. 40; Gray Man. ed. 2, p. 492.

*C. tenuiflorus*, Ell. Sk. 1, p. 70, non Rottb.

*C. occidentalis*, Torr. Cyp. p. 259; Hook. Fl. Bor.-Am. 2, p. 232 (forma depauperata).

HAB. Valley of the Upper Sacramento, California.—Plant varying from 2 or 3 inches to more than 4 feet high. Spikelets 12 to 40 flowered.

Besides the *Cyperi* here enumerated, there are, in the collection, specimens of another species which I cannot refer to any one hitherto found in North America. It somewhat resembles *C. Baldwinii*, but the rays of the umbel are shorter, the heads larger and somewhat compound, and the spikelets only 4-flowered. The fruit is not sufficiently mature to determine its characters.

3. HEMICARPHA, *Nees.*1. HEMICARPHA SUBSQUARROSA, *Nees.*

*Hemicarpha subsquarrosa*, Nees Cyp. in Endl. & Mart. Fl. Bras. p. 61, t. 4, f. 1;

Torr. Fl. N. York, 2, p. 362; Gray Man. ed. 2, p. 495.

*Scirpus subsquarrosus*, Muhl. Gram. p. 39.

*Isolepis subsquarrosa*, Schrad. in Schult. Mant. 2, p. 64; Torr. Cyp. l. c. p. 348.

HAB. Banks of the Sacramento, California.—Apparently rare on western side of the continent, but common on the eastern.

4. ELEOCHARIS, *R. Br.*1. ELEOCHARIS ROSTELLATA, *Torr.*

*Eleocharis rostellata*, Torr. Fl. N. York 2, p. 437; Steud. Cyp. p. 77; Gray, Man. ed. 2, p. 496,

*Scirpus rostellatus*, Torr. Cyp. l. c. p. 318.

HAB. Valley of the Sacramento, California; also in New Mexico, Sonora, and Western Texas, as well as throughout the proper Atlantic States.

2. ELEOCHARIS PALUSTRIS, *R. Br.*

*Eleocharis palustris*, R. Br. Prodr. p. 224 (in obs.); Torr. Cyp. l. c. p. 299; Steud. Cyp. p. 77; Gray, Man. ed. 2, p. 496.

HAB. Washington Territory, southward to the Valley of the Sacramento; common.—This species is as variable in the Pacific States as elsewhere. Some of the specimens are more than three feet long, with spikes an inch in length. There are also dwarf specimens, with slender wiry stems and large spikes. The bristles are sometimes wanting.

5. SCIRPUS, *Linn.*1. SCIRPUS PUNGENS, *Vahl.*

*Scirpus pungens*, Vahl. Enum. 2, p. 255; Gray, Man. ed. 2, p. 499.  
*S. triqueter*, Torr. Cyp. p. 322 (ex parte).

HAB. Gray's Harbor, Washington Territory, and near San Francisco, California.

2. SCIRPUS RIPARIUS, *Presl*.

*S. riparius*, Presl, Reliq. Hænk. 1, p. 192; Kunth, Enum. 2, p. 166.

*Elytrospermum Californicum*, C. A. Mey. Cyp. Nov. in Mem. Acad. St. Petersburg. (5 ser.) 1, p. 200, t. 2.

HAB. Borders of the Lower Sacramento, California.—Known from the eastern *S. validus* only by its broad and plumose bristles, or rather plume-like paleæ of the perigynium.

3. SCIRPUS MICROCARPUS, *Presl*.

*Scirpus microcarpus*, Presl, Reliq. Hænk. 1, p. 195; Steud. Cyp. p. 89.

*S. lenticularis*, Torr. Cyp. p. 88; Steud. Cyp. p. 88; Hook. Fl. Bor.-Am. 2, p. 230.

*S. sylvaticus*, Bong. Veg. Sitcha, p. 169.

HAB. Washington Territory and southward, in California, to the Lower Sacramento.—The earlier name of Presl is adopted for this species, which seems to be constant in the characters which distinguish it from *S. sylvaticus*.

4. SCIRPUS MARITIMUS, *Linn.*

*Scirpus maritimus*, Linn. Spec. ed. 2, p. 74; Torr. Cyp. l. c. p. 323.

HAB. Puget Sound and Gray's Harbor, Washington Territory.—Extends quite across the Continent in a more southern latitude.

6. ISOLEPIS, *R. Brown.*1. ISOLEPIS CARINATA, *Hook. & Arn.*

*Isolepis carinata*, Hook. & Arn., in Torr. Cyp. l. c. p. 349; Torr. Bot. Mex. Bound. p. 153.

*I. koilolepis*, Steud. Cyp. p. 318 (addend.).

HAB. Upper Sacramento, California, in exsiccated places.—Steudel has strangely omitted the earlier name of this species, although he has quoted, many times, the work in which it is described. There can be no doubt as to his *I. koilolepis* being identical with our plant, for he quotes No. 415 of Drummond's New Orleans collection, which is the same from which our original description was drawn.

## 2. ISOLEPIS PYGMÆA, Kunth.

Var. CALIFORNICA: *culmis dense cæspitosis; spica brevi-ovata; involucri monophyllo spicam plerumque vix æquante; squamis acutiusculis; achenio late obovato subtriangulato, angulis prominulis.*

HAB. Lower Sacramento, California.—Culms forming very dense tufts, 2 or 3 inches high, spreading and somewhat curved, slender and wiry. Leaves mostly solitary and very short. Spikes solitary, about 2 lines long, 12 to 15 flowered; involucre ovate and clasping at the base, tapering to a subulate point, which rarely exceeds the spike, and is mostly about half its length. Scales broadly ovate, rather acute, boat-shaped and keeled, not mucronate, the sides brownish red, keel and margins whitish. Stamens mostly 3, but sometimes 2. Style 3-cleft. Achenium slightly mucronate, compressed 3-sided, under a strong lens appearing striate, with extremely minute elevated dots, dark brown; the back flattish, the front very convex and carinately angular; the lateral angles also acute. This species does not agree altogether with any *Isolepis* described by Kunth or Steudel, but it seems to be nearest *I. pygmæa*.

## CAREX, Linn.

The species had not been elaborated and written out. The following list, drawn up by S. T. Olney, Esq., of Providence, gives the names of the species collected as far as can now be ascertained.

CAREX BRONGNIARTII, Kunth. Walla-Walla.

C. STIPATA, Muhl. Walla-Walla.

- C. GAYANA, Desv. in Fl. Chil. Gray's Harbor.  
 C. DOUGLASII, Boott. Walla-Walla.  
 C. HOODII, Boott. Washington Territory.  
 C. BOLANDERI, Olney, in Proc. Am. Acad. 7, p. 393 (1868). It is *C. remota*, Richardson (not of Linn.), *C. bromoides*, Dewey (not of Schk.) as to Nuttall's plant, and *C. pallida*, Carey (not of C. A. Meyer).  
 C. MACROCEPHALA, Willd. Satchap to Gray's Harbor.  
 C. JAMESII, Boott, not of Torrey.  
 C. SALINA, Wahl. Kooskooskee River.  
 C. LACINIATA, Boott, Ill. p. 175, t. 594 (1867). *C. Wilkesii*, Torr. Atlas, t. 17. Banks of the Sacramento, California.  
 C. APERTA, Boott. Nisqually, North Fork of the Columbia River, &c.  
 C. VERTICILLATA, Boott. Puget Sound, &c.  
 C. SITCHENSIS, Prescott. Gray's Harbor and Nisqually; also San Francisco.  
 C. AUREA, Nutt. Nisqually.  
 C. PENNSYLVANICA, Linn. Puget Sound.  
 C. UMBELLATA, Schk. Puget Sound.  
 C. GEYERI, Boott. Mountains of Oregon.  
 C. ARISTATA, R. Brown. Kooskooskee River.  
 C. LANUGINOSA, Michx. North Branch of the Columbia River.—One specimen is *C. hæmatorhyncha*, Desv. Fl. Chil.  
 C. RETRORSA, Schw. Walla-Walla.  
 C. BONGARDIANA, C. A. Meyer. Nisqually.

PLATE 17. CAREX WILKESII: Two forms, of the natural size. Fig. 1. Staminate scale and flower. 2. Pistillate scale and flower, towards maturity. 3. Section of a perigynium. 4. Achenium. 5. Transverse section of the same. 6. Mature perigynium, with scale, &c. Details variously magnified.

## ORD. 87. GRAMINEÆ.

By GEORGE THURBER.

### 1. LEERSIA, *Soland.*

#### 1. LEERSIA ORYZOIDES, *Swartz.*

HAB. On the Sacramento, and in other parts of California.

### 2. PHALARIS, *Linn.*

#### 1. PHALARIS INTERMEDIA, *Bosc.*

*Phalaris intermedia*, Bosc. in Poir. Encycl. 1, p. 300.

*P. microstachya*, DC. Cat. p. 131; Trin. Icon. t. 77.

*P. Americana*, Ell. Sk. Bot. S. Car. & Geo. 1, p. 101.

*P. angusta*, Nees in Mart. Flor. Bras. 2, p. 391; Trin. Icon. t. 78.

*P. trivialis*, Trin. Phalarid. p. 10.

*P. occidentalis*, Nutt. Trans. Am. Phil. Soc. New Ser. p. 144.

*P. Californica*, Hook. & Arn. Bot. Beechey, p. 161.

HAB. San Francisco and northward.—This widely disseminated species—of which the synonymy might be still further extended—is quite abundant upon the Pacific coast, and varies, according to situation, from 6 inches in height to 5 and even 8 feet. It is the “Californian Timothy” of the farmers of the coast.

#### 2. PHALARIS ARUNDINACEA, *Linn.*

HAB. On the Sacramento, California, Spokane, and northward.

3. P H L E U M, *Linn.*1. PHLEUM ALPINUM, *Linn.*

HAB. Cascade Mountains, Oregon.

2. PHLEUM ALPINUM, var. TENUE, *Trin.*

*Phleum alpinum*, var. *tenue*, Trin. Ic. t. 22.

HAB. Nisqually, Washington Territory.

4. A L O P E C U R U S, *Linn.*1. ALOPECURUS GENICULATUS, *Linn.*

HAB. On the Spokane, Washington Territory.

5. H I E R O C H L O A, *Gmelin.*1. HIEROCHLOA BOREALIS, *Rœm. & Schult.*

HAB. Nisqually and Spipen River.—I have not seen this species from California, it being there replaced by *H. macrophylla*, Thurb., which grows in tufts 2 or 3 feet high, has greenish panicles, and very obtuse glumes; leaves 12 to 18 inches long, and 5 to 6 lines broad.

6. P A S P A L U M, *Linn.*1. PASPALUM DISTICHUM, *Linn.*

*Paspalum distichum*, Linn.; Trin. Icon. t. 20.

*P. notatum*, Flügge, Monog. p. 106; Trin. l. c. t. 114.

*Panicum polyrhizon*, Presl, Rel. Hænk. 1, p. 296.

HAB. On the Sacramento, California.—This is the only species of



the genus that we have seen from the Pacific coast. It extends across the country from the southern Atlantic States to California. It forms long and strong creeping rhizomes, and frequently occurs in collections from the Pacific coast without inflorescence.

## 7. PANICUM, *Linn.*

### 1. PANICUM AGROSTOIDES, *Spreng.*

HAB. On the Sacramento, California.—This species from the Atlantic States occurs in the collection of the Expedition, but in no other from the Pacific coast that we have examined.

### 2. PANICUM CAPILLARE, *Linn.*

HAB. On the Sacramento, California.—Some of the forms of this species seem to be enough unlike the type to take at least the rank of a variety; but an extensive suite of specimens, collected at various stations from the Mississippi to the Pacific, shows that as it goes westward the plant becomes more robust, the branches of the panicle less capillary, and the mostly short-pedicelled florets larger and more acute.

### 3. PANICUM SCOPARIUM, *Lam.*

*Panicum scoparium*, Lam. *Encycl.*, 4, p. 744.

*P. pauciflorum*, Ell. ? *Gray Man.* ed. 5, p. 648.

HAB. Oregon.—Collected also by Spalding and Hall. This species, which occurs in the Eastern States, like the related *P. dichotomum*, assumes a variety of forms, and late in the season branches and sometimes becomes very puzzling. It is readily distinguished by a fold or crease at the base of the lower palet of the perfect floret, which is, under a strong lens, minutely dotted in lines.

### 4. PANICUM CRUS-GALLI, *Linn.*

HAB. On the Sacramento, California; no doubt introduced.

## 8. SETARIA, Beauv.

## 1. SETARIA GLAUCA, Beauv.

HAB. On the Sacramento, California; introduced.

## 9. ERIOCOMA, Nutt.

## 1. ERIOCOMA CUSPIDATA, Nutt.

*Eriocoma cuspidata*, Nutt. Gen. 1, p. 40.

*Stipa membranacea*, Pursh Fl. 2, p. 728.

*S. hymenoides*, Rœm. & Schult. Syst. 2, p. 339.

*Urachne lanata*, Trin. Panic. p. 126.

*Fendleria rhynchelytroides*, Steud. Syn. Plant. Glum. 1, p. 420.

HAB. North branch of the Columbia.—This strikingly beautiful species occurs eastward to the Missouri River, and its seeds form an important article of food to some of the Indian tribes of the interior. The root, which seems to be rarely secured by collectors, is very white, and its cortex, which separates readily from the woody portion in drying, is clothed with a dense mat of long woolly hairs.

## 10. ORYZOPSIS, Michx.

## 1. ORYZOPSIS EXIGUA, Sp. Nov.

*Panicula contracta*, radiis solitariis binisve erectis subsecundis unifloris; glumis obtusis mucronatis flosculo piloso paullo brevioribus; arista glumas subæquante; antherarum loculis apice barbatis.

HAB. Cascade Mountains, Oregon.—Minutely pubescent throughout. Culm slender and wiry, 6 to 8 inches high. Leaves 2 to 3 inches long, narrow, convolute, rigid and pungent; sheaths shorter than the internodes; ligule somewhat exceeding a line in length and lacer-

ate. Panicle 1 to 1½ inches long; rays mostly in pairs, one about equalling the flower, and the other twice its length. Glumes 2 inches long, obtuse and mucronate, puberulent, turning purplish with age, about one-fourth shorter than the floret, which has a rounded callus with a few short hairs. Lower palet one-nerved with scattered hairs and minutely puncticulate, bearing just below its apex a slightly twisted somewhat persistent awn about its own length; upper palet as broad as and slightly longer than the lower, faintly 2-nerved and strongly involute. Stamens three, bearded at the apex. Styles three, elongated and exserted. Squamulæ two, as long as the ovary, inequilateral. In two florets three styles were distinctly made out, but the specimens were generally too mature to enable us to determine if this is a constant character.

This species, which we have seen only in the collections of the Expedition, is most nearly allied to *O. Canadensis*, from which it abundantly differs in its simple and contracted panicle, its shorter glumes, and in its awn.

## 11. STIPA, *Linn.*

### 1. STIPA EMINENS, *Cav.*

*Stipa eminens*, Cav. Icon. 5, p. 42, t. 467, fig. 1.

*S. mucronata*, H. B. K. Nov. Gen., & Spec. 1, p. 103.

HAB. North branch of the Columbia.—The collection contains the panicle only of what agrees with a specimen determined as belonging to this species by General Munro. It chiefly differs from the related *S. setigera*, Presl, in having the lower palet hairy all over.

### 2. STIPA VIRIDULA, *Trin.*

*Stipa viridula*, Trin. in Act. Petrop. 1836; Trin. & Ruprecht, Stipeæ, p. 57.

*S. parviflora*, Nutt. Gen. 1, p. 59.

*S. spartea*, Hook. Flor. Bor.-Am. 2, p. 37.

*S. Nuttalliana*, Steud. Syn. Glum. 2, p. 643.

HAB. Nisqually, north branch of the Columbia River, &c.

3. STIPA COMATA, *Trin. & Rupr.*

*Stipa comata*, Trin. & Rupr. *Stipeæ*, p. 75.

*S. juncea*, Nutt. Gen. 1, p. 58.

*S. capillata*, Hook. Fl. Bor.-Am. 2, p. 37.

HAB. Okanagan and north branch of the Columbia River.

## 4. STIPA OCCIDENTALIS, Sp. Nov.

*Panicula contracta, radiis infimis bi-triternatis paucifloris, supremis solitariis unifloris; glumis lanceolatis acuminatissimis; flosculo albo-piloso brevi-coronato glumis paullo brevioribus; arista bigeniculata, inferne brevipilumosa; antheris nudis.*

*Stipa occidentalis*, Thurb.; Watson in U. S. Geolog. Expl. of 40th Parallel, p. 380; Bolander in Proc. Cal. Acad. Sci. 4, p. 169.

HAB. North branch of the Columbia and Okanagan. Since collected in California and Nevada by Bloomer, Bolander, and Watson, and on the Colorado of the West by Newberry.—Culms slender, 1 to 4 feet high, purplish, minutely scabrous, pubescent at the nodes. Radical leaves 4 to 8 inches long, those of the culm shorter, involute, filiform, rigid and rough; sheaths shorter than the internodes; ligule 2 to 3 inches long, lacerate. Panicle 3 to 6 inches long, the base often included in the upper sheath, few-flowered; rays mostly erect, the lower 1-2-, rarely 3-flowered; spikelets short-pedicelled. Lower glume 5 inches long, 5-nerved, the upper shorter and indistinctly 3-nerved. Lower palea 3 to 3½ inches long, brownish at maturity, pubescent with appressed hairs, especially below, with a short but distinct corona and a brief acute bearded callus; the upper palea three-quarters the length of the lower. Awn 1½ inches long, mostly twice bent and plumose to the upper geniculation with rather coarse hairs, less than a line long below and shorter above. Bolander remarks (*loc. cit.*) that this species has a wide range and is very variable; that on loose sandy soil at 4000 or 5000 feet altitude it assumes a reed-like appearance, but at high elevations and in rocky places is much reduced in size. He also notes that in the larger specimens the

awn is nearly smooth. In the specimens collected by the Expedition the awns are conspicuously plumose. Bolander states that this species is much esteemed by sheep-growers.

## 12. ARISTIDA, *Linn.*

### 1. ARISTIDA PURPUREA, *Nutt.*

*Aristida purpurea*, Nutt. in Trans. Am. Phil. Soc. N. Ser. 5, p. 145.

HAB. Walla-Walla, Oregon.—A very variable and widely distributed species, forms of which have received specific names; that in the collection is *A. æquiramea*, Scheele in Linnæa, 22, p. 343.

## 13. SPOROBOLUS, *R. Brown.*

### 1. SPOROBOLUS CRYPTANDRUS, *Gray.*

*Sporobolus cryptandrus*, Gray, Man. (1867), p. 610.

*Agrostis cryptandra*, Torr. in Ann. Lyc. N. Y. 1, p. 151.

*Vilfa cryptandra*, Trin. Agrost. 1, p. 49.

*V. Triniana*, Steud. Syn. Plant. Glum. 1, p. 156.

HAB. Walla-Walla, Oregon.

### 2. SPOROBOLUS RAMULOSUS, *Kunth.*

*Sporobolus ramulosus*, Kunth. Gram. 1, p. 68.

*Vilfa ramulosa*, H. B. K. Nov. Gen. & Spec. 1, p. 137, t. 684.

*Agrostis minutissima*, Steud. Syn. Plant. Glum. 1, p. 171.

HAB. Walla-Walla, Oregon.—This, which is a quite common species further south, we have not seen in any other collection so far north. The glumes are usually fringed at the apex, but there is a variation in this respect as there is in the mucronation of the lower palet, which, in New Mexican specimens, is often distinctly pointed from the prolongation of the mid-nerve.

14. POLYPOGON, *Desf.*1. POLYPOGON LITTORALIS, *Smith.*

HAB. San Francisco, California.—This, in Bolander's distributed sets, was called *P. fugax*, Nees (*P. Monspeliensis*, var. *fugax*, Trin.); but later specimens lead me to refer it as above. It seems to be a common grass upon the coast, and grows in similar situations with the *P. Monspeliensis*, which, though of frequent occurrence, is not in the collection. Mr. Bolander states that the present species is much earlier and more abundant than *P. Monspeliensis*, from which it is readily distinguished by its more open panicle and shorter awns.

15. GASTRIDIMUM, *Beauv.*1. GASTRIDIMUM AUSTRALE, *Beauv.*

HAB. San Francisco, California, and since found to be very common upon dry hills in most portions of the State.

16. AGROSTIS, *Linn.*1. AGROSTIS SCABRA, *Willd.*

HAB. Gray's Harbor, and common along the California coast.

2. AGROSTIS CANINA, *Linn.*

HAB. Near the mouth of the Spokane River; collected in California by Bolander.

3. *AGROSTIS EXARATA*, *Trin.*

*Agrostis exarata*, Trin. Gram. Uni.-Sesquifl. p. 207, & Icon. t. 27.

*A. asperifolia*, Trin. Agrostid. 2, p. 71.

*A. pallens*, Trin. l. c. p. 82.

*A. Schiedeana*, Trin. l. c. p. 81.

*A. microphylla*, Torr. Bot. Whipl. Rep. p. 154.

HAB. Numerous localities in California and northward.—That this is a very variable species is shown by the synonyms given above, those relating to Trinius's species being upon the authority of General Munro. It occurs, according to locality, from 2 inches to 4 feet in height, and, as is the case with other species of *Agrostis* on the northwest coast, varies as to the presence or absence of an awn to the lower palet, and the size of the upper one.

17. *CALAMAGROSTIS*, *Adans.*1. *CALAMAGROSTIS CANADENSIS*, *Beauv.*

HAB. Spokane River, Washington Territory.

2. *CALAMAGROSTIS ALEUTICA*, *Trin.*

*Calamagrostis Aleutica*, Trin. in Bong. Veg. Sitcha, p. 71; Gray in Proc. Am. Acad. 6, p. 80.

HAB. Gray's Harbor, Washington Territory.—Since collected by Bolander and others near San Francisco and elsewhere. According to Bolander it forms large tufts upon which cattle will feed in times of scarcity.

18. *PHRAGMITES*, *Trin.*1. *PHRAGMITES COMMUNIS*, *Trin.*

HAB. Sacramento, California, and Puget's Sound.

19. SPARTINA, *Schreb.*1. SPARTINA GRACILIS, *Trin.*

HAB. Okanagan, Washington Territory.

## 2. SPARTINA STRICTA, var. FOLIOSA.

*Spartina foliosa*, Trin. Agrost. 1, p. 92.

HAB. San Francisco, California.—There seems to be little doubt that this is the plant described by Trinius as *S. foliosa*, and that it is only a form of the variable *S. stricta* with the leaves much crowded at the top of the culm, and equalling or exceeding the panicle.

20. AIRA, *Linn.*1. AIRA DANTHONIOIDES, *Trin.*

*Aira danthonioides*, Trin. in Act. Petrop. 1830, 1, p. 57, & Icon. t. 257.

HAB. Spipen River and north branch of the Columbia.

2. AIRA ELONGATA, *Hook.*

*Aira elongata*, Hook. Flor. Bor.-Am. 2, p. 243, t. 228.

HAB. Nisqually, &c., Washington Territory.—The specimens vary in length from a few inches to two feet or more. The hairy abortive pedicel often as long as the floret below it.

3. AIRA CÆSPITOSA, var. LONGIFLORA, *Trin.*

*Aira cæspitosa*, var. *longiflora*, Trin. in Herb. Torr.

HAB. Nisqually and the north branch of the Columbia.—Some of the culms are 4 or 5 feet long, with the panicle of a fine bronze color, and quite agreeing with authentic specimens named by Trinius.



21. *TRisetum*, *Persoon*.1. *TRisetum subspicatum*, *Beauv.*

HAB. Cascade Mountains, Oregon; west side.

2. *TRisetum cernuum*, *Trin.*

*Trisetum cernuum*, Trin. in Act. Petrop. 1830, 1, p. 161.

HAB. Cascade Mountains, Oregon; east side.

22. *AVENA*, *Linn.*1. *AVENA FATUA*, *Linn.*

HAB. On the Sacramento, California.—This is the well-known “wild oat” of California, so valuable as a forage plant. It has generally been regarded as introduced from Southern Europe, but Mr. Bolander, who has especially noticed this grass, states in Trans. Cal. State Agricult. Soc. 1864–65, p. 38, his opinion that it is indigenous.

23. *DANTHONIA*, *DC.*1. *DANTHONIA SPICATA*, *Beauv.?*

HAB. Near the mouth of the Spokane.—On the Spipen River there was collected what seems to be a much-reduced form of this species, with the culms about 6 inches high; sheaths clothed with long spreading hairs, and leaves somewhat hairy; the panicle reduced to a single terminal spikelet. General Munro states that he had called this *D. unispicata*, in Herb. Trin. Coll. Dub., but that he since considered it only an abnormal state of *D. spicata*. The same was collected by Nuttall in the Rocky Mountains, and is his *D. monostachya*, Nutt. in Herb. Phil. Acad.

24. POA, *Linn.*1. POA ANNUA, *Linn.*

HAB. Nisqually, and very common in California.

2. POA ABBREVIATA, *R. Brown.*

*Poa abbreviata*, R. Br. in Parry's 1st Voy. App. pp. 287 & 309.

HAB. Puget Sound, Port Discovery, and Nisqually, Washington Territory.

3. POA STENANTHA, *Trin.*

*Poa stenantha*, Trin. in Mem. Acad. Petrop. 6, ser. 1, p. 376.

*P. leptocoma*, Trin. l. c. p. 374?

*Festuca nervosa*, Hook. Fl. Bor.-Am. 2, p. 251, t. 232.

HAB. Various parts of Oregon and Washington Territory.

25. ERAGROSTIS, *Beauv.*1. ERAGROSTIS REPTANS, *Nees.*

HAB. On the Sacramento River, California.

2. ERAGROSTIS ALBA, *Presl.*

*Eragrostis alba*, Presl, Rel. Hænk. 1. p. 279.

HAB. On the Sacramento River, California.—In the old plant the spikelets have from 10 to 15 florets. The mucro of the lower palet is not a constant character, it being present and wanting in florets of the same spikelet.

26. BRIZOPYRUM, *Link.*1. BRIZOPYRUM SPICATUM, *Hook. & Arn.*

HAB. San Francisco, California, and northward.

## 2. BRIZOPYRUM SPICATUM, var. STRICTUM.

*Brizopyrum spicatum*, var. *strictum*, Watson in Bot. King. Rep. p. 385.

*Uniola stricta*, Torr. in Ann. Lyc. N. Y. 1, p. 155, & in Marcy, Rep. p. 301, t. 20.

*U. multiflora*, Nutt. Trans. Am. Phil. Soc. (n. ser.) 5, p. 148.

HAB. Sacramento, California, and northward.—The very rigid form with large spikelets appears so unlike the typical plant that it is not strange that Torrey should consider it a species. The abundant specimens that have since been collected show that it runs into the ordinary *B. spicatum*.

27. GLYCERIA, *R. Brown.*1. GLYCERIA NERVATA, *Trin.*

HAB. Spokane and Gray's Harbor, Washington Territory.

2. GLYCERIA PALLIDA, *Trin.*

HAB. Walla-Walla, Oregon.

3. GLYCERIA DISTANS, *Wahl.*

*Glyceria distans*, Wahl. Fl. Ups. p. 36.

*Poa distans*, Linn. Mant. p. 32.

*P. airoides*, Nutt. Gen. 1, p. 68.

*Atropis airoides*, Griseb. in Ledeb. Fl. Ross. 4, p. 388.

HAB. Nisqually, Washington Territory.—Nuttall in describing his

*Poa airoides*, says: "Scarcely distinct from *P. distans*, except in habit." After comparing his specimens with those from numerous collectors, we can see no reason for keeping it distinct.

4. GLYCERIA ANGUSTATA, *R. Brown.*

*Poa angustata*, *R. Brown* in *Parry's 1st Voy. App.* p. 287 & 309.

*P. Nutkaensis*, *Presl*, *Rel. Hænk.* 1, p. 272.

*Atropis angustata*, *Griseb.* in *Ledeb. Fl. Ross.* 4, p. 390.

HAB. Not given; doubtless in Washington Territory.—Has only been collected by others in high latitudes.

28. LOPHOCHLÆNA, *Nees.*

1. LOPHOCHLÆNA CALIFORNICA, *Nees.*

*Lophochlæna Californica*, *Nees* in *Tayl. Ann. Nat. Hist.* 1, p. 283; *Hook. & Arn. Bot. Beechey*, p. 403, t. 95.

*Pleuropogon Douglasii*, *Trin.* in *Steud. Plant. Glum.* 1, p. 292.

HAB. Cascade Mountains, Oregon, where it seems to have been rare, as there is but one specimen in the collection. Since found in great abundance by the California botanists; also a second species.

29. MELICA, *Linn.*

1. MELICA POÆOIDES, *Nutt.*

*Melica poæoides*, *Nutt.* *Plant. Gamb.* p. 188; *Torr. Bot. Whipl. Rep.* p. 157; *Bolander in Proc. Cal. Acad.* 4 (1870), p. 101.

HAB. Oregon; north branch of the Columbia.—This species has a wide range, and varies so much in size and number of florets, that it is rare to find specimens corresponding with the original ones of Nuttall. He describes the spikelets as having only 2 perfect flowers, but it oftener has 3 or 4, and in the var. *inflata* of Bolander 6 to 8.

2. MELICA GEYERI, *Munro*.

*Melica Geyeri*, Munro in Proc. Cal. Acad. 4 (1870), p. 103.

*M. poæoides*, var. *bromoides*, Bolander, Cat. (1867), No. 6, p. 119.

HAB. Cascade Mountains, Oregon.—This has a tuberous root the fibres of which are villous. It differs especially from *M. poæoides* in its proportionately shorter glumes and acute terminal flower.

30. KÆLERIA, *Persoon*.1. KÆLERIA CRISTATA, *Pers*.

HAB. Oregon, &c.—The specimens include some slender forms, nearly the *K. nitida*, Nutt.

31. FESTUCA, *Linn*.1. FESTUCA MYURUS, *Linn*.

*Festuca Myurus*, Linn. Spec. Pl. p. 109.

*F. megalura*, Nutt. Plant. Gambel. p. 188.

HAB. San Francisco, California.

2. FESTUCA MICROSTACHYS, *Nutt*.

*Festuca microstachys*, Nutt. Plant. Gamb. p. 187; Torr. Bot. Whipl. Rep. p. 156.

HAB. Oregon and California.—Nuttall described the plant from a small form which occurs in the collections, but not so abundantly as the larger states referred to in Whipple's Report. In Nuttall's description it is inadvertently stated that the lower glume is 3-nerved: it should be the upper one.

3. *FESTUCA OVINA*, var. *DURIUSCULA*, *Gray*.

HAB. Spokane and the Columbia River, Oregon, &c.

4. *FESTUCA PAUCIFLORA*, *Thunb.*

*Festuca pauciflora*, Thunb. Fl. Jap. p. 152.

*F. occidentalis*, Hook. Fl. Bor.-Am. 2, p. 249.

*F. parvigluma*, Steud. Syn. Plant. Glum. 1, p. 305.

*F. remotiflora*, Steud. l. c. p. 315.

HAB. Nisqually and Cascade Mountains.—Some of the specimens quite agree with the authentic *F. occidentalis* in Herb. Torr., while in others the glumes are somewhat longer.

32. *BROMUS*, *Linn.*1. *BROMUS CARINATUS*, *Hook. & Arn.*

HAB. Nisqually, Washington Territory.

2. *BROMUS BREVIARISTATUS*.

*Ceratochloa breviaristata*, Hook. Fl. Bor.-Am. 2, p. 253, t. 234; Watson in Bot. King. Rep. p. 389.

HAB. Nisqually, Washington Territory.—The specimens, which are in a very imperfect condition, are doubtfully referred to this.

3. *BROMUS HOOKERIANUS*.

*Ceratochloa grandiflora*, Hook. Fl. Bor.-Am. 2, p. 253, t. 235.

HAB. Willamette, &c., Oregon.—In reducing *Ceratochloa* to *Bromus* we find the specific name *grandiflorus*, already occupied. It is well that this finest of the species should bear the name of the lamented botanist who first described and well illustrated it.

33. TRITICUM, *Linn.*1. TRITICUM REPENS, *Linn.*

HAB. California and Oregon; common.

34. HORDEUM, *Linn.*1. HORDEUM PRATENSE, *Huds.*

*Hordeum pratense*, Huds. Fl. Angl. p. 56.

*H. adscendens*, H. B. K. Nov. Gen. & Spec. 1, p. 180.

HAB. Oregon, in several localities.

35. ELYMUS, *Linn.*1. ELYMUS SIBIRICUS, *Linn.*

*Elymus Sibiricus*, Linn. Spec. Pl. p. 123.

*E. villosus* var. *glabriusculus*, Torr. in Whipl. Rep. p. 157.

HAB. Satchap and Spokane Rivers, Washington Territory.

2. ELYMUS CANADENSIS, *Linn.*

HAB. Walla-Walla, Oregon.

3. ELYMUS ARENARIUS, *Linn.*

HAB. Port Discovery, Washington Territory.

4. ELYMUS MOLLIS, *Trin.*

*Elymus mollis*, Trin. in Spreng. n. Entd. 2, p. 72.

HAB. Not stated: probably on the coast of Washington Territory.

5. ELYMUS DASYSTACHYS, *Trin.*

*Elymus dasystachys*, Trin. in Ledeb. Ill. t. 249; Ledeb. Fl. Alt. 4, p. 333.  
*E. mollis*, R. Brown in Frankl. Journ. ed. 2, App. p. 3.

HAB. Walla-Walla, Oregon.—This is a much smaller plant than the preceding species, and abundantly distinct from it in its subulate, almost setaceous glumes.

6. ELYMUS CONDENSATUS, *Presl, l. c.*

HAB. North branch of the Columbia, Oregon.

7. ELYMUS SITANION, *Rœm. & Schult.*

*Elymus* (?) *Sitanion*, Rœm. & Schult. Mant. 2, p. 426; Watson in Bot. King, Rep. p. 391.

*Sitanion Elymoides*, Raf. in Jour. Phys. 89, p. 103.

*Ægilops hystrix*, Nutt. Gen. 1, p. 86.

*Polyantherix hystrix*, Nees in Tayl. Ann. Nat. Hist. 1, p. 284.

HAB. California and Oregon.—This extremely variable grass has, as the synonymy shows, long been a puzzle to botanists. Many years ago Mr. Bolander called our attention to Californian specimens which could not be separated from *Elymus*, and we are glad that Watson has restored it to that genus, of which it is at most a subgenus. Like most of the grasses of wide geographical range, it varies much as to foliage, length and rigidity of awns, &c. The fragile character of the rachis and the readiness with which the spike is broken into fragments make it a troublesome plant to the collector.





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